IRON AND COPPER METABOLISM


The authors own summary is given:

"Sections and smears of bone marrows from 23 iron-deficient patients have been studied both before and at various stages after initiation of treatment. Marrows from 12 normal patients served as controls."

"The bone marrows of patients with untreated iron-deficiency anemia were, on the average, more erythroblastic and more cellular than the marrows of the normal controls, but variability in both groups was so great that the histopathology of the marrow cannot be considered diagnostic."

"No appreciable correlation was found between the severity of the anemia and the degree of erythroblastic hyperplasia in the marrows of untreated patients."

"The marrow responds to treatment by intensified hyperplasia, roughly proportional to the degree of anemia."

"Stainable iron appeared in the marrow rapidly after treatment of iron-deficiency anemia with intravenous saccharated iron oxide, but more slowly or not at all after oral administration of iron."

"Needle biopsies of the liver revealed no constant pathologic changes. After administration of intravenous saccharated iron oxide, storage appeared to take place exclusively in the Kupffer cells."

"The importance of continuing oral iron therapy for a long time after the peripheral blood picture has returned to normal has been stressed."—T.R.T.


The technic used by Walsh, et al. (Science 110: 396, 1949) was used to investigate the mode of action of copper in iron metabolism. Blood cells were obtained from rabbits that were bled repeatedly to increase the reticulocyte count. The bone marrow cells were obtained from chicks or turkey poults. The authors have found that iron uptake by blood cells is dependent upon washing the cells with 0.93 per cent sodium chloride prior to incubation. The amount of iron taken up varied directly with the number of times the erythrocytes were washed with sodium chloride before incubation. The authors also have shown that the addition of copper increases the iron uptake. Similar results were found with
bone marrow cells. The more often the cells were washed with sodium chloride the more iron was taken up. In addition, copper also increased the amount of iron taken up by bone marrow cells. In the previous work by Walsh, he reported finding a correlation between the reticulocyte count and iron uptake. In the present study, using rabbit blood, this correlation was not obtained.—R.C.C.


Many marine animals accumulate large amounts of copper from sea water, producing a concentration of copper within their bodies far exceeding that in their external environment. They produce blue-colored respiratory pigments, known as hemocyanins; these carry nearly all of the copper found in their bodies. An equilibrium constant for the dissociation of copper from hemocyanin has been calculated from a series of experiments in which cyanide, which has a known affinity for cuprous ion, is allowed to compete with the protein for the metal.—O.P.J.


Radioactive iron, principally Fe\textsuperscript{59}, has been used frequently as a tracer in the study of red cell dynamics. The authors point out, however, that the use of radioactive iron introduces difficulties because of the reutilization of iron which has been freed from the destroyed erythrocytes. The authors point out that this characteristic makes the use of iron unsuited as a tracer for following transfused red cells over an extended period of time since one cannot determine what part of the activity is due to the radioactive iron reincorporated in newly formed cells. Radioactive nitrogen, N\textsuperscript{14}, has been found to be a better substance to use in blood volume work. The erythrocytes were tagged with both nitrogen and iron and injected into a normal dog. Twenty-six days later a hemolastic crisis was artificially produced. This decreased the red cell mass approximately 64 per cent. It was found that the nitrogen decreased in the blood stream and remained at a low level. The iron, on the other hand, showed the initial decrease but then gradually increased in amount, showing that it was being incorporated in new erythrocytes.—R.C.C.


A review of papers on the clinical use of intravenous saccharated iron oxide shows that toxic reactions fall into two groups, early and late. The early reactions are commonest and include pain in various regions, symptoms suggesting both sympathetic and parasympathetic stimulation and those of circulatory collapse. The delayed reactions include dizziness, weakness, rigors, fever, vomiting, urticaria, various pains, and collapse. The purity of the sucrose employed in making the preparation is important, and early reactions are believed to be due to individual hypersensitivity to impurities present in commercial sucrose.

The majority of delayed reactions are believed to be due to the gradual precipitation of the compound as occurs in animals given large doses. Saccharated iron oxide is most likely to precipitate in the lung capillaries after intravenous injection and this precipitation is most likely to occur in those whose capillary bed in the lungs is greatly reduced by disease.

Care should be taken in using the substance in arteriosclerotic patients, as transient anginal pain and back pain suggests ischemia of the myocardium and kidneys. Discussion of toxicity of an iron compound must be confined to the one in question as their toxic mechanisms differ.—R.H.G.

The Effect of Habitually High Iron Intake on Certain Blood Values in Pregnant Bantu Women. Th. Gerritsen and A. R. P. Walker. From the Human Biochemistry Unit,
ABSTRACTS


Evidence in the literature indicates that as pregnancy proceeds, a significant fall occurs in levels of hemoglobin and hematocrit, presumably due to an increase in plasma volume exceeding any increase in hemoglobin and red cells. In addition, there is a rise in the iron binding capacity of serum. The serum level has been reported by some investigators to fall, while others have found no significant change from normal. In the present study, pregnant and nonpregnant Bantu women were studied in regard to the above findings. These women were on an inadequate diet low in animal protein, fat, and certain vitamins and mineral salts. However, the diet was high in iron, ranging from 23 to 202 mg., the mean being 171 mg. per day. Data in the first and second halves of the pregnancy period are compared. There was no significant change in values for hemoglobin, hematocrit, or serum iron. No anemia developed. The iron binding capacity rose. The authors offer as the most likely explanation for the failure to develop any anemia, the possibility that there is a quantitative increase in the hemoglobin and total red cells parallel to the increase in plasma volume. They further speculate that the increase in red cells and hemoglobin is related to and possibly the result of the subjects' unusually high iron intake.—R.B.C.

TOTAL SERUM BINDING CAPACITY FOR COPPER. L. Donner and S. Dan.. From the 2nd Medical Clinic, Charles University, Praha. Cas. lek. 91: 902, 1952.

1. It has been shown that the copper content in native serum does not increase when small amounts of copper as copper sulphate are added to the serum. The added copper reacts quantitatively with sodium diethyldithiocarbamate independently of the primary concentration of copper in serum employed.

2. Intravenously administered copper increases the serum copper only for a very short period and even daily administered copper by injection does not permanently increase the copper in the serum.

3. The increase of copper in the serum after intravenous injection is partly caused by copper that is not combined with the serum protein. This copper reacts directly with sodium diethyldithiocarbamate. Half an hour after the injection, the total serum binding capacity for copper increases by 33.1 ± 9.4 per cent. This increase disappears gradually in two hours at which time the total serum saturation for copper becomes normal again.

4. It is assumed that copper and iron do not compete for the same protein and that the copper binding protein has a very low and only transitory capacity of binding excessive amount of this metal.—M.N.

HEMOCHROMATOSIS, L. Heilmeyer. From the Klinik Eisenstoffwechsel und Pathogenese, Medical Department, University of Freiburg, Germany. Acta haemat. 11: 137-151, 1954.

The incidence of hemochromatosis, its symptomatology, and the changes in the blood picture are reviewed. A series of 36 cases has been observed. An abnormally increased iron absorption in the intestinal tract is generally accepted as the cause.

The author discusses the etiological factors, as constitution, exogenous poisons (alcohol, copper, lead), protein lack in nutrition, infectious diseases (hepatitis), reduction of pancreatic secretion and modifications in the redox system of the intestinal mucous membrane.—C.M.

LEUKOCYTE PHYSIOLOGY and DISEASE


As it is well known that epinephrine injections cause a release of ACTH from the pituitary, the authors decided to study the effects of ingested protein on the pituitary ad-
renal system, because Abelin had indicated the possibility that ingested proteins produced changes in the functions of the organism similar to those caused by epinephrine. Twenty-four human beings ranging in age from 18 to 31 years were used in this work. Fourteen were males and ten were females. The effect on the pituitary adrenal system was determined by counting the circulating eosinophils after treatment. Gelatin in amount of 0.5 Gm. per Kg. of body weight was ineffective. A dose of 0.5 Gm. of casein per Kg. caused a decrease which reached its maximum four hours after ingestion. There was a 33 per cent decrease in circulating eosinophils. Tyrosine in a dose of 0.3 Gm. per Kg. of body weight effected a very similar fall, whereas a double dose produced a fall of 43 per cent. The maximum in these cases was also reached in four hours. The authors point out the possibility that the relatively simple components of our daily diet could have definite endocrinologic functions. It may be assumed that quantitative deviations from the optimal composition of the diet could lead to endocrinologic and metabolic diseases.—R.C.C.


The desoxyribonucleic acid phosphorous and ribonucleic acid phosphorous content per cell of neutrophils undergoing devolution in thirteen fairly large abscesses showed definite relationships, which were demonstrated graphically in a scatter diagram. The lines of regression developed were related to the bacteria which gave rise to the infection.—O.P.J.

ERYTHROPHAGOCYTOSIS BY PROMYELOCYTES. O. Ullrich, and H. R. Wiedemann. From the Pediatric Clinic University, Bonn, Germany. Acta haemat. 11: 134-136, 1954.

In the blood of a two year old child the authors noticed many promyelocytes with ery throphagocytosis. This observation, which is new and important, indicates a functional activity of the immature myeloid cell.—C.M.


By use of an antileukocytic serum the authors produced agranulocytosis in guinea pigs. Repeated subcutaneous serum administration produced a prolonged granulocytopenia with accompanying bone marrow changes of an increase in the immature forms and a general increase in cell size. By the experiments it is proved that this form of agranulocytosis is produced by peripheral agglutination and removal of the leucocytes and not by direct injury of the bone marrow.—C.M.

THE INFLUENCE OF A PLASMA FACTOR ON IN VITRO LEUCOCYTE MIGRATION. M. M. Ketchel and C. B. Favour. From the Medical Clinics, Peter Bent Brigham Hospital, Department of Medicine, Harvard Medical School, and the Biological Laboratories, Harvard University, Boston, Mass. Science 118: 79-80, 1953.

By drawing heparinized venous blood into capillary tubes these authors have been able to watch the migration of leucocytes with a microscope. With this technic they have been able to show that the rate of migration of leucocytes is strongly influenced by a factor in the plasma. Although the authors have found that this substance in the plasma which conditions the migration of leucocytes is heat labile and nondialyzable, the substance has not as yet been identified.—R.C.C.

A 23 year old thyrotoxic woman was given carbimazole in a dosage of 10 mg thrice daily for eight weeks. She developed thrombocytopenic purpura and pyrexia, followed by agranulocytosis and anemia. She was treated with blood transfusion and antibiotics, together with ACTH and cortisone for seventy-two days. Postmortem examination confirmed the diagnosis of aplastic anemia. —R.H.G.


A 37 year old woman was given carbimazole (2-carbethoxythio-l-methylglyoxaline) in a dosage of 15 mg daily for nine days then 30 mg daily for thirty days. She developed a sore throat and became feverish and was given 3.0 Gm. of sulphadimidine and penicillin lozenges. The total white cell count was found to be 150 per cu.mm., no polymorphs being seen. There was a response to blood transfusion and antibiotics. —R.H.G.

Hematopoietic Responses to Provocatives. B. Steinberg and R. A. Martin. From the Toledo Hospital Institute of Medical Research, Toledo, Ohio. Arch. Path. 57: 227-243, 1954.

Leucopenias of variable length and severity followed by a leucocytosis, either granulocytic or lymphocytic, have been produced by injecting a wide variety of substances. These results have been interpreted as follows: (1) The action is nonspecific and not significant biologically; (2) The action represents a phase of the hematopoietic mechanism; (3) A large number of the different materials produce a non-specific action which appears first, and then they set into motion a phase of the hematopoietic mechanism, and (4) Some materials are basically specific, but they evoke an initial non-specific action which in its turn sets into motion another phase of the hematopoietic mechanism with a resultant confusion in the interpretation of results. Leucopenia in rabbits was produced by injecting such provocation as bacteria and their fractions, cell-free products of bacterial growth, fractions of various bovine organs, plasma and milk. The conclusions are that the leucopenia is due initially to vascular stasis, adhesious of granulocytes to the vascular endothelium, and redistribution of leucocytes to various viscera. Following the initial phase of leucopenia, granulocytes migrate from the vascular lumina and disintegrate. No single organ is responsible for leucocyte destruction. The bone marrow responds to the stimulus supplied probably by disintegrating leucocytes. —O.P.J.


A study of rat tissue mast cells in skeletal muscle, heart muscle, and mesentery was undertaken to determine the morphological variation in these cells under physiological conditions and stimuli. The following substances were administered to various groups of rats: thyroxine, desoxyhydrocorticosterone acetate, cortone acetate, heparin, a histamine liberator, and a hyaluronidase. It was concluded that in ordinary histologic preparations the morphologic features of the tissue mast cell are too variable and artifacts too frequent to allow any valid interpretations. —O.P.J.


Administration of cortisone reduced the number of basophils in the circulating blood. This parallelism with the similar response of eosinophils raised the question in the authors' minds whether this indicated a fundamental physiologic association between the two types of cells. Such a question at the present time can lead only to speculation. —P.F.W.

Optical Isomers of Cysteine in the Prevention of Leukopenia Induced by Nitrogen
ABSTRACTS

MUSTARD. A. S. Weisberger and J. P. Storaasli. From the Departments of Medicine and Radiology, Lakeside Hospital and the School of Medicine, Western Reserve University, Cleveland, Ohio. J. Lab. & Clin. Med. 45: 246-252, 1954.

"D-cysteine is not as effective as L-cysteine in preventing the leukopenia and neutropenia induced by HN2.

"Thus a specific spatial configuration as well as the presence of a sulfhydryl, amino, and carboxyl group in close apposition appears to be required for preventing the leukotoxic effect of HN2.

"It is unlikely that the protective effect of L-cysteine is due solely to chemical inactivation of HN2 in vivo.

"The requirement of such structural and spatial specificity suggests that L-cysteine or closely related compounds may have a unique role in leukocyte metabolism."—T.R.T.

CHRONIC LEUKOPENIA BY AUTOANTIBOIDS. P. Miescher. From the Department of Medicine, University of Lausanne, Switzerland. Acta haemat. 11: 152-167, 1954.

A case of chronic leucopenia is described due to a factor in the serum. This factor was contained in the β2- and γ-globulins and had the characteristics of an antileucocytic antibody. The peculiar character of this factor was determined by these observations: (1) The intravenous injection of 3 to 3.5 ml. of serum per Kg. body weight caused death in rabbits by leucocytic emboli in lungs and kidneys. (2) Absorption tests showed that the addition of normal leucocytes inhibited the action of the serum. (3) After absorption, the β2- and γ-globulin fractions in the serum of the patient were diminished. (4) The leucopenic factor remained even after splenectomy and after clinical cure of the patient.—C.M.

SYSTEMIC LUPUS ERYTHEMATOSUS. EARLY CYTOLOGIC DIAGNOSIS. E. Dubois. From the University of Southern California School of Medicine, Los Angeles, California. California Med.: 80: 154-158, 1954.

In the diagnosis of systemic lupus erythematosus, it is recommended that the "L.E." cell test be performed routinely on heparinized samples from both venous blood and bone marrow.

The finding of two typical "L.E." cells is considered positive. The finding of rouleaux, "hematoxylin" bodies, or rosettes is not considered truly positive.

L.E. cells were demonstrated in 68 per cent of the tested patients with disseminated lupus.—C.E.R.


There are relatively few comparable analyses in the literature. However, no significant information is added by this study to the general clinical knowledge of lymphosarcoma.—P.F.W.


Ever since Langhans described giant cells in tuberculosis, there has been little agreement about the source of these cells, the method of their formation, and their functional importance. Reports of previous tissue culture experiments have also failed to mention the exact mode of formation and the time needed for development. In the present experiments, cultures made from buffy coat were explanted on the surface of perforated cellophane in D-5 Carrel flasks containing pooled human serum diluted with Gey's solution.
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After explantation, one to two hours elapsed before there was a good area of migration. The epithelioid cells appeared at the same time as did the giant cell; it was a hypertrophied derivative of the monocyte and could also fuse to form multinucleated giant cells. Amitosis may have occurred in some cultures.—O.P.J.


Diluted human and other mammalian blood serum (15 ml. of fresh blood serum diluted with 10 ml. of freshly distilled water, with 6 ml. of 5 per cent formalin solution in distilled water added) can be used as a good adhesive for paraffin sections. It is preferable to Mayer's egg albumin-glycerol mixture because it is easily obtainable, can be quickly prepared, and sections are less subject to loosening after its use.—O.P.J.

**Bone Marrow Pressure in Leukemia and Non-Leukemia Patients. N. L. Petrakis.** From the Laboratory of Experimental Oncology, National Cancer Institute, National Institutes of Health, Public Health Service, Department of Health, Education and Welfare and the Department of Medicine and Cancer Research Institute, University of California School of Medicine, San Francisco, California. J. Clin. Investigation 33: 27-34, 1954.

It has been observed that bone pain and tenderness may occur in leukemia and that patients with leukemia and multiple myeloma may bleed excessively from the site of a bone marrow aspiration. These observations suggest some degree of pressure elevation and the present study was undertaken to determine the pressure relationships within the human marrow cavity. This was accomplished by the attachment of a bonded SR 4 wire resistance strain gauge to a previously inserted sternal or iliac crest marrow needle or to a needle inserted in the iliac crest. Observations were made under resting conditions and under various stimuli such as the Valsalva maneuver, the Mueller maneuver, changes in position, and the injection of epinephrine. It was found that the leukemia patients had increased pressures in both the sternal and iliac marrow, as compared to normals. The Valsalva maneuver further increased this pressure; the Mueller maneuver decreased it. The sternal marrow pressure initially dropped when there was a change from the upright to the recumbent position; then it increased. The iliac crest marrow pressure showed a progressive increase under similar circumstances. The intravenous injection of 0.05 mg. of epinephrine resulted in a decrease of the mean pressure. All these changes were more marked in the patients with leukemia. The author states that the findings reported support the concept that the marrow cavity physiologically resembles a semi-closed cavity, which is readily affected by changes in venous pressure (Valsalva maneuver), afferent arterial flow (epinephrine), and body position or respiratory alterations. The bone pain in coughing in leukemia may represent a manifestation of the sudden elevation of intramedullary pressure with distortion of the arteries and arterioles bearing sensory nerves.—R.B.C.


A special study of the white blood cell and differential counts was made on 100 cases of viral hepatitis. The clinical diagnosis was confirmed in all cases by liver function tests, by liver biopsy in 35 cases, and in three cases by postmortem investigations.

The cases were classified as typical, when the course was less than 45 days, prolonged, when the course was over 45 days, recurring, and fatal hepatitis.

A normal blood count was found in 73 per cent of the cases, leucopenia in 19 per cent, and only 8 cases showed leucocytosis.

Absolute lymphocytosis was found in 40 per cent, slight monocytosis in 13 per cent eosinophilia was present in 24 per cent of the cases. The eosinophilia was moderate, with an average of 8.5 per cent, but it reached 18 per cent in a fatal case.

There appeared to be definite correlation between the eosinophilia and the liver fun-
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tions tests. The authors suggest that the degree of eosinophilia may have prognostic implications and that its determination may be of help in following the clinical course of the disease.—R.M.S.


In a series of 60 hematologic cases studied postmortem, there were 25 cases of malignant lymphoma, 17 cases of leukemia, 5 cases of multiple myeloma, and 5 cases of aplastic anemia. Amyloidosis was found only in cases of lymphoma and of multiple myeloma. Four of ten cases of Hodgkin's lymphoma of the granuloma variety showed amyloidosis with a distribution typical of the secondary form. In two of these cases a nephrotic syndrome was evident clinically as an expression of amyloid infiltration of the kidneys. When the deposition of amyloid occurred in the liver or in the spleen, the congo red test was the only help to diagnosis, but it often happened that these cases were diagnosed only at autopsy.

Low blood pressure might be present in cases of adrenal amyloidosis. There was fever in three of the four cases of lymphoma. Bence-Jones protein was found in one of these cases, as well as in one of the cases of multiple myeloma showing primary amyloidosis.

The authors suggest that a search for amyloidosis be made in chronic hematologic diseases where definite histopathological changes are evident or where there are clinical signs not accounted for by the blood disease itself.—R.M.S.


In 27 cases seen in an army camp, the Paul-Bunnell test result was negative in all; an absorption method was used. The clinical features were of the usual diverse type and in nine patients the spleen was palpable. All cases had a maximum total lymphocyte count exceeding 4,000 per cu. mm. Abnormal lymphocytes were seen in all instances.

As in other such epidemics, the features differed from those of sporadic seropositive cases of infective mononucleosis in that there was a high degree of infectivity, a lymphocyte count of less than 50 per cent of the total white count, a frequent rash, infrequent pyrexia, and a protean clinical picture.

It is suggested that the epidemic form is a different disease from infectious mononucleosis.—R.H.G.

IMMUNOHEMATOLOGY


Almost a decade ago Owen reported in Science (102: 400, 1945) his discovery of the phenomenon of compound blood types associated with multiple births in cattle. Subsequently this condition became known as erythrocyte mosaicism. This condition is believed to be derived from the fact that hemopoietic tissues have been obtained in part from their own embryonal cells and in part from embryonal cells of the co-twin. Fusion of blood vessels between developing embryos provides the channels for the intermingling of embryonal cells with subsequent establishment of these cells in the hematopoietic beds of each individual so joined. When the autograft produces cells of a serologic type different from that of the cells produced by the homograft, erythrocyte mosaicism ensues. The present paper is a report of erythrocyte mosaicism in sheep.—R.C.C.

False Positive Results in the Diagnosis of Rare Blood-Group Antigens. F. Strat-
ABSTRACTS

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In the diagnosis of rare blood-group antigens it is important to remember the possibility of polyagglutinability. This is a condition in which a person's erythrocytes, while not usually agglutinated by their own serum, are agglutinated by other normal sera of homologous ABO groups. Five new cases are mentioned. The percentage of compatible sera with which the affected cells reacted varied from 9 to 60 per cent.—R.H.G.


It is well known that a Rhesus antibody of any given specificity may occur as a "saline antibody" that will agglutinate red cells suspended in saline and as an "albumin antibody" that will agglutinate red cells only if they are first treated with a proteolytic enzyme. The blood of a sensitized woman may contain either or both, but only the albumin antibody is demonstrable by standard methods in the blood of her new born baby. Now there is described the occurrence of saline anti-Rhesus antibodies in the blood of three such babies, following replacement transfusion in two, and simple transfusion in one. Albumin antibody alone was demonstrable in the blood of each of the three before transfusion, and none of the donors' bloods contained anti-Rhesus saline antibodies or irregular agglutinins of any other type.

The change in antibody in the cord blood could be reproduced by adding donors' serum in vitro. The authors call the serum of a donor able to produce this change an "antibody-transforming" serum and they call the saline antibody that develops, a "hidden saline" antibody, and describe some of the properties of each.—R.H.G.


Observations on three patients with eclampsia (two fatal cases) are reported. Hemoglobinemia, hemoglobinuria, thrombocytopenia, and clotting defects occurred. The authors consider that an immunologic process may be involved.—P.F.W.


One of the two possible explanations for the progressive nature of certain hemolytic reactions is that the system contains an internal phase near the red cell surfaces, and that this phase is less affected by dilution than is the bulk phase of the system. The use of radioactive hemolysins and of new color reactions has made it possible to detect uptakes of at least five lysins. Apparently lysis in systems containing simple hemolysins is a process involving two stages in time and two phases, and is usually complicated by reactions between the hemolysin and liberated inhibitory material.—O.P.

STUDIES ON THE NORMAL SERUM PANAGGLUTININ ACTIVE AGAINST TRYPSINATED HUMAN ERYTHROCYTES III. PANAGGLUTININ TITERS IN INFANTS AND YOUNG CHILDREN. T. H. Spaet, and M. Anderson. From the Department of Medicine, Stanford University School of Medicine, San Francisco, Calif. J. Lab. & Clin. Med. 44: 208-211, 1954.

Previous studies have shown that an agglutinin could be found in all of a large number of normal human serum tested, which was capable of agglutinating trypsinized erythro-
cytes of the same blood specimen. Some of the properties and reactions of this normal autoagglutinin have been described. It has been found to be distinct from cold agglutinin, to be mainly concentrated in Cohn's fraction I + III, and is capable of being absorbed and subsequently eluted from trypsinated erythrocytes. Inasmuch as this normal autoagglutinin (NAA) has certain properties in common with antibodies, studies were undertaken to determine whether the development of the NAA titer with age showed a corresponding similarity to that of other known antibodies. In the studies herein reported, the development of cold agglutinin titers was compared to that of NAA titer in infancy and early childhood.

It was found that the NAA activity of newborn infants as well as that found in the various age groups was quite constant. Cold agglutination was found in none of the subjects under six months of age, and then appears in low titer in only an occasional subject of the next few age periods. NAA, however, was uninfluenced by age.

It is postulated that this indicates that NAA is not an antibody, but merely a non-specific activity of some abnormal protein. The same mechanism is suggested in acquired hemolytic anemia and idiopathic thrombocytopenic purpura.—T.R.T.


A case is presented in which a baby, born to a woman with disseminated lupus erythematosus, was found to have a serum positive for the LE test at birth, a questionable test at age 7 weeks, and a negative test at age 4 months. There was no evidence of production of antibodies against the LE factor in the baby.—T.R.T.

NEOPLASTIC DISEASES

COMPARATIVE EFFECTS OF TOTAL BODY RADIATION, NITROGEN MUSTARD AND TRIETHYLENE MELAMINE ON THE HEMATOPOIETIC SYSTEM OF TERMINAL CANCER PATIENTS. R. K. Loeffler, V. P. Collins, and G. A. Hyman. From the Departments of Radiotherapy and Pathology, Francis Delafield Hospital, Columbia-Presbyterian Medical Center, New York, N. Y. Science 118: 161-163, 1953.

The authors point out that nitrogen mustard and allied agents have come to be considered as alternative agents for radiotherapy in the treatment of several forms of cancer. Where both agents are of known effectiveness, nitrogen mustard is usually preferred for generalized disease, for the dose of total body radiation is believed to be limited to an ineffective level by radiation sickness and bone marrow depression. This experiment on ten patients with advanced cancer was done to compare the effectiveness of nitrogen mustard and total body irradiation. Contrary to general belief, the total body irradiation produced fewer symptoms than did the nitrogen mustard. There was no indication that total body irradiation in doses commonly used in the clinic would permanently injure the bone marrows. Two patients were given 50 r, one 100 r, and one 150 r of radiation treatment. One patient received 5 mg. of methylbis amine (HN2) intravenously while two others received 10 mg. of this substance. One patient received 5 mg. of triethylene melamine orally, while two others received 10 mg. of this substance. The x-ray factors were two million volts peak potential, target-skin distance 360 cm., filter 4 mm. of lead, half value layer 6.6 mm. of lead, air dose 50 r, skin dose 55 r, depth dose at 10 cm. 41 r, and depth dose at 20 cm. 23 r.—R.C.C.


From experience with twenty-five patients the authors divide the cases into three groups: (1) a solitary form in which a large tumor is present; (2) a diffuse form in which the lesions are small and cause a diffuse decalcification of the affected bone; and (3) a multiple form into which the others usually develop when the plasma cells are ag-
ABSTRACTS

gregated into discrete nodules forming localized osteolytic lesions. The first group was found in younger patients (average 40 years) but ultimate spread to the multiple form occurred in all instances. The diffuse form occurred over the age of 60. The solitary type was found in three males and one female, and the multiple type in eleven females and seven males.

Local pain is the common initial symptom, but pathologic fracture and paraplegia are not infrequent. Bence Jones protein is often absent from the urine and may be present in secondary carcinoma of bone and myelogenous leukemia. A reversed albumin/globulin ratio and raised E.S.R. is frequent. The authors doubt the value of any form of therapy, but deep x-ray may relieve pain.—R.H.G.


A 44 year old woman had a painful swelling on the chest wall, over the sternum, of twelve months' duration. The swelling was not palpable and the lymph glands not enlarged. X-ray examination showed erosion of the left sternoclavicular joint and adjacent sternum. The swelling was incised, and the lesion was thought to be tuberculous or syphilitic. The swelling developed into a large ulcer 5 inches in diameter and 1 inch deep. Glandular enlargement then occurred in the neck and after gland biopsy a diagnosis of lymphadenoma was made. There was marked temporary improvement with deep x-ray therapy.—R.H.G.


A 55 year old man with a three year history of dyspepsia had been considered from radiologic examination to have a pyloric ulcer. At laparotomy there appeared to be sarcoma of the stomach, with palpable masses in the pelvis. The hemoglobin level was 78 per cent and the red cell count 4,500,000 per cu.mm.

At postmortem a diagnosis of gastrointestinal lymphomatosis was made. The stomach, cecum, and pelvic colon were the main sites of the disease. There was enormous submucous infiltration with lymphocytes, which did not involve the muscle layers. No metastases were found, and the lymph glands and spleen were not involved. In gastrointestinal lymphomatosis it is unlikely that a diurnal turnover of lymphocytes occurs, for this would mean the daily replacement of some pounds' weight of lymphoid tissue.—R.H.G.


Among the hemopoietic disorders, polycythemia vera and chronic myelocytic leukemia appear to be the conditions most frequently benefited by radiophosphorus therapy. It is emphasized again that such treatment is of only slight if any value in multiple myeloma. As a rule the results of treatment of Hodgkin's disease, lymphosarcoma, and chronic lymphatic leukemia with radiophosphorus are inferior to those of therapy with roentgen rays or nitrogen mustard.—P.F.W.

HEMATOPOIETIC TISSUES


When foreign particles such as carbon are injected into the blood stream, they are removed by the reticuloendothelial cells. The clearance of various kinds of india ink from the blood followed an exponential equation, the constant K of which was called the granulopctic index, reflecting the activity of the reticuloendothelial system of the animal for a given dose of carbon. Animals injected with a blocking dose of carbon without shellac re-
covered within 3 days, but those receiving carbon with shellac did not recover until the twelfth day. The administration of such antimitotic substances as nitrogen mustard and cortisone retard the return of normal granulopoietic activity following a blocking dose of carbon.—O.P.J.


In previous experiments on a small number of animals, it was noted that ACTH produced an increase in the total absolute count of nucleated marrow cells. In order to establish the possible myelopoietic action of ACTH, individual steroid hormones were administered. No clear-cut difference could be established between compounds E and F. However, compound A produced a threefold increase in marrow lymphocytes and increased the number of granules in reticulum cells. The latter matured rapidly to a myelocyte stage, with little sign of myeloblast formation.—O.P.J.


Metachromasia is a property particularly characteristic of mucopolysaccharides. The intensity of staining which varies in certain tissues and blood cells has been attributed to depolymerization of the mucopolysaccharide components. Quantitative studies on the interaction between the basic thiazene dye toluidine blue and a number of synthetic and naturally-occurring acidic polysaccharides were undertaken to investigate this physico-chemical mechanism. It was found that the intensity of metachromasia is directly related to the number and the dissociation characteristics of the attached acidic radicles, but not to the nature, disposition, or number of the constituent units for glucose polymers containing more than four saccharide units. Apparently metachromasia is not dependent on the extent of polymerization of the acidic polysaccharide itself, but on the solubility characteristics of the dye-substrate complex.—O.P.J.

**RARE PARASITE OF THE SERGENTELLA GROUP FOUND IN HUMAN BLOOD.** O. Soyka and O. Jirovec. From the 2nd Medical Clinic, Charles University, Praha and from the Parasitological Institute, Charles University, Praha. Časopis lékařský. 91: 1202, 1952.

During an incidental investigation of blood reticulocytes stained with brilliant cresyl blue, the authors discovered a parasite of the Sergentella group. It differed from the Sergentella hominis Brumpt 1910 in the length and mucous coating. By reporting this rare observation, the authors wish to draw the attention of other hematologists to the fact that these rare parasites may occur in our regions too.—M.N.
ABSTRACTS