

ABSTRACTS

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ABSTRACTERS

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ERYTHROCYTES and ERYTHROCYTIC DISEASE

THE DIAMETER OF ERYTHROCYTES IN CHILDHOOD. *H. Weicker, J. Wagner, A. B. Guttman, F. Kreiger, H. F. Lohrey, and H. Zimmermann.* From the Pediatric Clinic, University of Heidelberg, Heidelberg, Germany. *Acta haemat.* 10: 50-64, 1953.

The mean cell diameter, the scatter of cells, and the steepness of frequency distribution curves were estimated in individual patients and the results arranged in age groups. The mean cell diameter increases immediately after birth, then decreases from the second week until the end of the first year and increases again from the second year onwards.—*C.M.*

ELECTRON MICROGRAPHS OF ERYTHROCYTES FROM SWISS ALBINO MICE INFECTED WITH HERPES SIMPLEX VIRUS (STRAIN P38). *R. L. Reagan, W. C. Day, and A. L. Brueckner.* From Virus Laboratory, University of Maryland, College Park, Md. *Am. J. Path.* 29: 767-770, 1953.

Virus-bearing brain material from the fifteenth intracerebral mouse passage was injected subcutaneously into fourteen Swiss albino mice. Animals of the control group were inoculated with a brain suspension prepared from normal mice. Two animals from each group were bled from the heart 24, 48, 72, 96, 120, 144, and 168 hours after inoculation. Cell suspensions from each group were prepared for electron microscopic examination by placing small drops of the erythrocyte-saline suspension on parlodian film supports. These were dried and shadowed with chromium. No virus-like particles could be detected in the control group. A few virus-like particles were seen on the surface of erythrocytes obtained 72, 96, 120, and 144 hours. The virus apparently left the blood stream between 144 and 168 hours. However, test animals 168 hours after inoculation exhibited symptoms of central nervous system involvement even though no virus particles could be demonstrated in the erythrocyte specimen.—*O.P.J.*

AN ANALYSIS OF THE PHOTOELECTRIC METHOD FOR STUDYING OSMOTIC CHANGES IN CHICKEN ERYTHROCYTES. *F. R. Hunter.* From the Department of Physiology, Florida State University, Tallahassee, Fla. *J. Cell. & Comp. Physiol.* 41: 387-405, 1953.

A sensitive apparatus was constructed in order to use rates of swelling as a measure of permeability. However, since hemolysis times may be influenced by a variety of factors, and slight hemolysis occurs under a variety of circumstances, it was difficult to interpret the results obtained. Wilbrandt (1941) suggested a variation of this general technic to measure the permeability to nonelectrolytes which consisted of equilibrating erythrocytes in a salt solution plus the nonelectrolytes. Measurements were then made of the shrinking cells as the nonelectrolyte leaves the cells into a surrounding salt solution. The term frailty was introduced to designate the tendency of erythrocytes to hemolyze following volume changes in a solution which at equilibrium should be isosmotic. In some cases, fragility and frailty may not be the same—quantitatively if not qualitatively.—*O.P.J.*

CONCENTRATION OF HEMOGLOBIN IN THE BLOOD OF DEEP SEA FISHES. *L. Van Dam and P. F. Scholander*. From Woods Hole Oceanographic Institution, Woods Hole, Mass. *J. Cell. & Comp. Physiol.* 41: 522-524, 1953.

The iron content of the blood has been determined in eleven species of deep sea fish caught at depths of 125 to 945 meters. The values fall inside the range of those found in shallow water fishes. There is no indication, therefore, that deep sea fishes have developed a high oxygen capacity of the blood as a possible means of facilitating the secretion of oxygen against high pressures.—*O.P.J.*

POSITION OF HAEMS IN THE HAEMOGLOBIN MOLECULE. *D. Keilin*. From the Molteno Institute, University of Cambridge, England. *Nature (London)* 171: 922-925, 1953.

The theory of the embedded position of hemes is that they lie within a fold or crevice of the globin. The steric hindrance theory is based upon the assumption that the four heme groups of hemoglobin are buried within the globin. Professor Keilin considers that study of the structure and properties of hemoglobin and its derivatives supports neither theory. On the contrary, much of the evidence suggests that the hemes are attached to the surface of the globin through linkages with both the iron and the porphyrin.—*R.H.G.*

SIGNIFICANCE OF URORENNIN EXCRETION IN PERNICIOUS ANEMIA. *E. G. Olmstead and J. S. Hirschboeck*. From the Milwaukee County General Hospital, Milwaukee, Wis. *Am. J. M. Sc.* 226: 84-87, 1953.

In 1949 Sylvest demonstrated that the milk coagulating ability (urorennin activity) of urine could be accurately measured, and that this activity was decreased in patients with pernicious anemia.

Fifty patients with pernicious anemia in remission were studied to determine the fasting excretion of urorennin; fifty normal patients aged 40 to 90 years were also studied.

No patient with pernicious anemia excreted more than 0.5 R.U. (rennin unit) per 10 cc. of urine, and forty-six of them excreted less than 0.30 R.U. per 10 cc. of fasting morning urine. In the normal group, thirteen excreted less than 0.5 R.U. and the remainder more than 0.5 R.U.

It is concluded that if a patient excretes more than 0.50 R.U. per 10 cc. of fasting morning urine, it is extremely unlikely that he has pernicious anemia; but that if he excretes less than 0.50 R.U. he may or may not have pernicious anemia and further study is indicated.—*T.R.T.*

A FOLIC ACID EXCRETION TEST IN THE INVESTIGATION OF INTESTINAL MALABSORPTION. *R. H. Girdwood*. From the Department of Medicine, University of Edinburgh, Edinburgh, Scotland. *Lancet* 2: 53-60, 1953.

The urinary excretion of folic acid after a dose of 5 mg. of folic acid given subcutaneously was compared with the excretion after 5 mg. given orally. In ten cases of intestinal malabsorption (tropical sprue, idiopathic steatorrhea, celiac disease or tuberculous mesenteric glands) the excretion after the oral dose was much less than that after the injected dose. One of these cases had never been megaloblastic, and a similar result of the "differential folic acid excretion test" was found in a case of "refractory iron deficiency anemia", whose fat balance result and x-ray intestinal pattern were normal. Where folic acid depletion of the tissues was severe, preliminary saturation with folic acid injections was necessary to make the test possible. There was no similar diminished output following the oral test dose in fifteen cases of pernicious anemia, fourteen patients without megaloblastic anemia or five patients with anemia in pregnancy. It was possible to have megaloblastic anemia of pregnancy responding to folic acid without evidence by this test of tissue depletion of folic acid. There appear to be at least four different types of megaloblastic anemia of pregnancy. The test was negative in a patient with megaloblastic anemia due to an ileosigmoid fistula

and in another with steatorrhea and megaloblastic anemia following total gastrectomy. It is hoped that this test will be of value in the diagnosis of intestinal malabsorption, especially where the presenting features are refractory megaloblastic anemia, refractory iron deficiency anemia, or glossitis, or where fat balance tests cannot be performed.—*R.H.G.*

TREATMENT OF POLYCYTHAEMIA RUBRA VERA. *R. B. Scott.* From St. Bartholomew's Hospital, London, England. *Brit. M. J. 1:* 1128-1131, 1953.

Of thirty-five patients with this condition, twenty were treated with P^{32} . Of these, sixteen have been observed for more than a year, and thirteen have had a satisfactory remission lasting a year or longer.—*R.H.G.*

APLASTIC ANAEMIA OCCURRING EIGHT YEARS AFTER T.N.T. POISONING. *F. G. J. Hayhoe.* From the University of Cambridge, England. *Brit. M. J. 1:* 1143-1144, 1953.

A man aged 45 was exposed to T.N.T. for two months in 1943 and developed jaundice which was attributed to this exposure. In 1951 he developed dermatitis from working with machine oils, and in 1952 he was admitted to hospital with aplastic anemia, from which he died. It seemed likely that the three illnesses were unconnected.—*R.H.G.*

IRON METABOLISM

EFFECT OF CONTINUED IRON ADMINISTRATION ON GROWTH. *J. A. Nissim.* From the Department of Pharmacology, Guy's Hospital Medical School, London, England. *Nature (London) 171:* 1157, 1953.

Studies on the effects of repeated parenteral administration of iron to mice, rabbits, and guinea pigs led to various toxic manifestations. In general, however, there was little interference with growth with colloidal or diffusible forms of iron. The diffusible iron preparation ferric hydroxide ferrous ascorbate, however, depressed growth markedly. This substance, given in a dosage of 11.25 mg. iron/Kg. daily subcutaneously to guinea pigs led to hemorrhage in the lungs, and histologic damage in the adrenals and anterior pituitary. In one instance iron staining was found in the cells of the anterior pituitary. No such results were found with saccharated iron oxide or ferric chloride caramelate.—*R.H.G.*

STUDIES ON INTERMEDIARY IRON METABOLISM. I. MODIFICATIONS OF METHODS FOR MEASURING SERUM IRON AND IRON BINDING CAPACITY OF SERUM. II. VARIATIONS OF THE SERUM IRON VALUE IN BLOOD DONORS AND CONTROL SUBJECTS. *I. Kaldor.* From the N.S.W. Red Cross Blood Transfusion Service, Sydney, Australia. *Australian J. Exper Biol. & M. Sc. 31:* 41-48, 1953.

In the first paper of this series a method is described which is a modification of Kitzes et al. The only major change is that of adding hydrochloric acid before the addition of trichloroacetic acid thus assuring a clear supernatant after centrifugation and avoiding the necessity of double extractions. Further evidence was accumulated which showed that hemoglobin is precipitated with the serum proteins without introducing a measurable increase in iron content of serum.

A modification is also presented of the method of Rath and Finch for determination of serum iron binding capacity. It is based on the use of a spectrophotometric blank consisting of serum to which a saturating amount of iron has been added. The instrument is then set using this blank and the end point interpreted as that obtained when three successive additions of iron solution give equal readings for the blank and test solutions.

In the second paper the serum iron content of donors who had given 400 to 450 ml. of blood on each of ten or more occasions was measured by the method previously described. There were seventy-five controls and seventy-three donors, with blood collected at various times from 9 a.m. to 4 p.m. No significant difference was found between the two groups. Higher values were found in the morning than in the afternoon.—*T.R.T.*

THE ANEMIA OF COPPER DEFICIENCY IN DOGS COMPARED WITH THAT PRODUCED BY IRON DEFICIENCY. *J. Van Wyk, J. Baxter, J. Akeroyd, and A. Motulsky.* From the National Institutes of Health, Bethesda, Md. and Walter Reed Army Medical Center, Washington, D. C. *Bull. Johns Hopkins Hosp.* 93: 41-48, 1953.

Induced iron deficiency in dogs resulted in hypochromic microcytic anemia and bone marrow changes typical of those commonly recognized previously in man and dogs.

In contrast, the anemia which occurred in copper deficient dogs was characterized by a reduction in the number of erythrocytes, with maintenance of relatively normal red cell indices. Reticulocytes were decreased. No spherocytes were found and the plasma showed no increase in bile pigment. In the marrow there was no evidence of a deficiency in hemoglobin content but rather evidence of defective development of erythrocytic elements.

It is concluded that irrespective of any role that copper may play in the metabolism of iron and the formation of hemoglobin, copper is essential in the dog for the normal maturation of erythrocytic elements in the marrow and the production of normal numbers of red blood cells.

Nineteen control dogs, twenty-seven copper-deficient dogs, and five iron-deficient dogs were studied. The dogs were maintained on the experimental diets for one hundred to one hundred fifty days.—*C.E.R.*

LEUKOCYTES and LEUKOCYTIC DISEASE

THE EFFECT OF CORTISONE ON MACROPHAGE ACTIVITY IN MICE. *P.G.H. Gell and I. T. Hinde.* From the Department of Experimental Pathology, University of Birmingham, England. *Brit. J. Exper. Path.* 34: 273-275, 1953.

In order to isolate the phagocytic function, experiments were carried out using macrophages in two anatomic situations, the blood and the peritoneal cavity. Colloidal radioactive gold was given intravenously to mice and formalised suspensions of *Staphylococcus albus* intraperitoneally. Both approaches led to the conclusion that cortisone does not interfere directly with the function of macrophages. The results were consistent with the theory that cortisone suppresses mesenchyme cell activity in tissues so strikingly by altering the tissue environment, not the cells themselves.—*O.P.J.*

THE OCCURRENCE OF PLASMA CELLS AFTER IONIZING IRRADIATION IN DOGS. *F. J. Wohlwill and W. W. Jetter.* From Department of Legal Medicine, Boston University School of Medicine, Boston, Mass. *Am. J. Path.* 29: 721-729, 1953.

The appearance of plasma cells in lymph nodes, spleen, tonsils, intestine, and bone marrow was studied in seventeen control dogs and in thirty-four dogs following whole body x-irradiation. High dose animals were given doses varying from 250 to 400 r, and low dose dogs exposures from 100 to 150 r. A 2 million volt Van de Graaff x-ray generator with 12.5 mm. Cu h.u.l. was used as a source of radiation. The average dose rate at the animal midline was about 12 r per minute. Plasma cells occasionally are present in hematopoietic organs of dogs, chiefly in the medullary cords of lymph nodes. X-irradiation results in the appearance of these cells where they did not occur before or where they were very scanty. In numerous instances plasma cells were derived from the reticuloendothelial system.—*O.P.J.*

CHEMOTAXIS OF MONOCYTES. *H. Harris.* From the Sir William Dunn School of Pathology, Oxford, England. *Brit. J. Exper. Path.* 34: 276-279, 1953.

A method previously described for demonstrating chemotaxis in granulocytes was modified for the study of chemotaxis in monocytes obtained from the rabbit peritoneal cavity. It was shown that monocytes were no less subject to chemotaxis than granulocytes. Although the movement of the monocytes was slower, their advance towards a chemotactic object was, if anything, more direct than that of granulocytes.—*O.P.J.*

FATAL AGRANULOCYTOSIS AND GASTRIC ULCERATION DUE TO PHENYLBUTAZONE. *N. V. Dilling*. From the Royal Lancaster Infirmary, England. *Lancet* 1: 1230-1231, 1953.

A patient with rheumatoid arthritis was given 600 mg. of phenylbutazone daily for five days, then, seven days later, 400 mg. daily for three days. Edema, epigastric pain, diarrhea and vomiting of blood-stained fluid occurred. The white cells numbered only 1440 lymphocytes and 60 monocytes per cu.mm., and the hemoglobin level was 8 Gm. per 100 ml., red cells 3,300,000 per cu.mm. At necropsy the stomach contained many superficial erosions.—*R.H.G.*

AGRANULOCYTOSIS CAUSED BY PHENYLBUTAZONE AND 4-AMINO-ANTIPYRINE. *J. M. Kiely and J. M. Stickney*. From the Division of Medicine, Mayo Clinic, Rochester, Minn. *Proc. Staff Meet., Mayo Clin.* 28: 341-345, 1953.

A 56 year old patient with rheumatoid arthritis, after receiving 30 Gm. of phenylbutazone over a period of approximately seven weeks, developed soreness of the mouth and gums, nausea, and fever. The leukocyte count dropped to 600 per cu. mm. of blood and no neutrophils were seen on the blood smear. The hemoglobin was 12.2 Gm. per 100 cc. of blood and the platelets were 162,000 per cu. mm. Following cessation of the drug and treatment with cortisone and penicillin, neutrophils appeared after nine days. Subsequent recovery was uneventful.

A 26 year old woman with rheumatoid arthritis had taken 4-amino-antipyrine for two months (1200 mg. daily) when she developed sore throat and a leukopenia of 600 per cu. mm. with 96 per cent lymphocytes. With cessation of the drug and administration of supportive therapy recovery was uneventful.—*P.F.W.*

COMPARATIVE EFFECTS OF TOTAL BODY AND TAIL HEATING ON THE PERIPHERAL LEUKOCYTE COUNT OF THE RAT. *B. H. Ershoff and J. G. Gaines*. From the Emory W. Thurston Laboratories, Los Angeles, Calif. *Science* 118: 20-21, 1953.

A reduction in the peripheral lymphocyte counts has been widely employed as an index of adrenocortical activation in the rat. It is becoming increasingly apparent, however, that a number of factors other than the amount of circulating corticoids may alter the peripheral lymphocyte count and hence may affect the validity of this measurement as an index of adrenocortical activity. The present experiment was done to determine the comparative effects of total body versus localized tail heating on the peripheral leukocyte count of the rat. Animals receiving the tail heating received same by wrapping the animal in a towel and suspending the tail in hot water before the blood was obtained. Total body heating was administered by placing rats in small metal cages with screen sides and bottom before an electric heater for a period of 20 to 30 minutes. Blood in the latter group was obtained by cutting the tail, but the tail had had no previous localized heating. The animals receiving the heat on the tail only showed no difference in the white blood count from control animals. In contrast, the animals receiving total body heating showed a significant reduction in total white blood count and lymphocyte count. The literature indicates that there is a difference in the white cell count of peripheral blood and that of heart blood, the count being higher in the peripheral blood. This has been explained by a damming up of white cells in the peripheral areas of the vascular system as a result of the normal resistance of the arterioles and capillaries to the flow of blood. When rats were anesthetized with ether, the difference in white cell count between heart and peripheral blood was abolished, presumably because the ether caused a relaxation of the contractile elements of the blood vessels in the periphery. In the present experiment total body heat similarly resulted in a significant reduction in the leukocyte count of peripheral blood to values comparable to those of heart blood. The authors think that body heating induced an increase in circulation rate and small vessel dilatation, which would explain the decrease in white count when blood is obtained from the tail.—*R.C.*

EXPERIMENTS CONCERNING THE PRODUCTION OF LE-CELLS. *T. Inderbitzin*. From the Department of Dermatology, University of Zurich, Zurich, Switzerland. *Acta haemat.* 10: 31-36, 1953.

In normal leukocytes, changes were produced experimentally which were morphologically the same as genuine L.E. cells. This was possible with a normal serum which had been heated to 58 C. with a high molecular polyvinyl-alcohol-polysulfuric acid-ester. It is pointed out that the production of L.E. cells in acute disseminated lupus erythematosus may depend on the occurrence of abnormal mucopolysaccharides which, combined with gamma globulins, produce Haserick's factor.—*C.M.*

ACUTE PERICARDITIS ASSOCIATED WITH INFECTIOUS MONONUCLEOSIS. *H. Miller, J. F. Uricchio, and R. W. Phillips*. From the Rhode Island Hospital, Providence, R. I. *New England J. Med.* 249: 136-140, 1953.

Case histories of three patients are presented. Each showed clinical, hematologic, and serologic evidence of infectious mononucleosis. Substernal and anterior chest pain was present in each. A pericardial friction rub was audible in each case and persisted for one to four days. Serial roentgenograms revealed cardiac enlargement in two cases with return to normal size during the hospital course. T-wave changes were present in the electrocardiograms of each case. The pertinent literature is reviewed.—*P.F.W.*

LEUKEMIA and LYMPHOMA

PROTEINS IN MULTIPLE MYELOMA. II BENCE-JONES PROTEINS. *F. W. Putnam and P. Stelos*. From the Department of Biochemistry, University of Chicago, Chicago, Ill. *J. Biol. Chem.* 203: 347-358, 1953.

The term Bence Jones protein applies to a group of proteins often found in the urine of individuals with multiple myeloma and identified by their property of precipitating at 45 to 55 C. and redissolving with boiling. Urinary proteins from eighteen cases were studied by electrophoretic analysis, ultracentrifugation, and the measurement of diffusion constants. Striking differences in homogeneity and electrophoretic mobility were found. Seven of the Bence Jones proteins had a range of isoelectric points varying from pH 4.6 to pH 6.7. All appeared to have molecular weights at about 43,000. This physicochemical analysis did not indicate the origin of the proteins.—*P.F.W.*

PANMYELOSIS AND CHRONIC GRANULOCYtic LEUKEMIA. *B. Black-Schaffer and L. D. Stoddard*. From Department of Pathology, Duke University School of Medicine, Durham, N. C. *Am. J. Path.* 29: 413-449, 1953.

All cases in the files covering the period 1931 to 1950 labeled as myelogenous leukemia were re-examined. It was found that those diagnosed as chronic myelogenous leukemia constituted a heterogeneous group which could be subdivided on the basis of pathologic anatomy alone into the following categories: chronic granulocytic leukemia: panmyelosis without myelofibrosis, and with myelofibrosis; myelofibrotic panmyelosis associated with granulocytic leukemia and with reticuloendotheliosis. Panmyelosis is defined as a generalized proliferation of marrow tissue—granulocytic, erythrocytic, megakaryocytic, and sometimes even connective tissue—both within and without marrow cavities. In these cases pleomorphic proliferations were found in the bone marrow, spleen, liver, and lymph nodes, but rarely in other organs and tissues.—*O.P.J.*