LEUKOCYTES


The authors applied the Steffen test to the bone marrow of 30 patients with acute leukemia and 32 with lymphogranulomatosis. This method offered a possible means for detecting antibodies to the bone marrow cells. The presence of antibodies was more characteristic of acute leukemia in its leukopenic form. In a number of cases, symptomatic pancytopenia in acute leukemia and lymphogranulomatosis may be due to the appearance of antibodies to bone marrow.—J. K.


In one patient, bone marrow cells and blood lymphocytes cultured with phytohemagglutinin (PHA) showed perfectly normal karyotypes. In the second patient, PHA-cultured blood lymphocytes had normal karyotypes, as did skin cells, although many of these were polyploid. All bone marrow metaphases were abnormal; three abnormal stemlines were demonstrated. During the course of the disease, the marrow changed from complete dominance of megaloblasts (84-96 per cent of all mitoses occurring in erythroid precursors) to complete dominance of myeloblasts (100 per cent of mitoses occurring in white cell precursors). During the same time, the relative proportions of the three stemlines changed, but all the original stemlines were still present after myeloblastic transformation had occurred. This finding suggested that the megaloblasts and myeloblasts were derived from a common pool of precursor cells.—S-A. K.


A 3½ month old boy who had received exchange transfusion as a neonate presented with fever, rash and diarrhea. Hypogammaglobulinemia, pancytopenia with an aplastic marrow, markedly diminished lymphoid tissue, and histiocytosis of spleen, lymph nodes and bowel were found in pre- and post-mortem studies. Hassall's corpuscles were present, but were markedly reduced in number. Plasma cells were seen in both bone marrow and spleen. The authors suggested that this disorder might represent runt disease.—J. B. S.
ABSTRACTS


A blood-thymic barrier has been thought to preclude any cellular reaction to circulating antigens by preventing their entry into the parenchyma of the thymus. Lymphatic nodules, however, were formed in the thymus of guinea pigs after two injections into the carotid artery of a mixture of typhoid-paratyphoid bacillary vaccine and physiologic saline with added histamine solution, whereas injection of either the vaccine and saline without histamine or saline and histamine without the vaccine did not induce the formation of nodules. All nodules appeared in the medullary portion of interlobular lymphocyte accumulations contiguous to the medulla or in the medullary tissue contiguous to the accumulations and were not seen elsewhere.—O. P. J.


A male infant, two of whose brothers died in infancy, developed repeated infections after age 12 months. Leukopenia with predominant neutropenia and only occasional lymphopenia were present. Infections continued, despite gamma globulin injections, and he succumbed to Pseudomonas sepsis at 11 months. Bone marrow aspirations pre- and post-mortem revealed myeloid arrest and the apparent presence of plasma cells. At autopsy, a minute thymus was found, composed almost entirely of poorly differentiated epithelial cells. Lymphoid tissue was generally scanty, contained fewer than normal numbers of small lymphocytes and had no germinal centers. Increased numbers of plasma cells were present in spleen and lymph nodes, but none were seen in tonsils or appendix. Immunologic studies revealed increased γM-globulin, but markedly deficient γG- and γA globulins. The patient was group O, but isohemagglutinins were not detectable. The authors pointed out that the immunologic patterns seen in patients with a lymphoplasia are disparate and suggested that the mechanisms of production of each of the immunoglobulins and of the lymphocytes result from independent genetic factors.—J. B. S.


Thymic reticular cells of the guinea pig have been studied at different stages of development and involution: the fetus in the last third of pregnancy, the newborn, the pubescent adult and the adult implanted with estradiol. The thymic reticulum consists of two cell categories, the amount of which is unequal: desmosomal reticular cells and phagocytic reticular cells. Most reticular cells are epithelial cells since they always contain tonofilaments and desmosomes and occasionally microvilli or mucous droplets. The presence of such epithelial cells seems to be the principal cytologic feature of the thymus. The phagocytic reticular cells resemble those of other lymphatic organs. No morphologic evidence of a thymic secretory activity has been found.—O. P. J.


The use of pigs as experimental animals in medical research has been increasing. Lymph collected from chronic lymphatic fistulae was found to be useless as a source of lymphocytes because it contained very few cells. These observations suggested that, in the pig, the absence of recirculation of lymphocytes from blood to lymph did not influence the extent or nature of the immune response. Either lymphocyte recirculation was unnecessary for immunologic responsiveness or lymphocytes recirculated by another route. Large numbers of lymphocytes could have entered lymph nodes via blood capillaries and then could have left the nodes by the same route. Until the results of further work have provided the answer to this question, it might be better not to assume that the pig is a suitable experimental animal for all aspects of medical research.—O. P. J.


Atypical nuclei occur among small lymphocytes and plasma cells and are detected best in un-
stained sections viewed with light or phase microscopy. They are largely indistinguishable with conventional methods of staining, but do stain selectively with a technic which depends on exposure of methylene blue stained sections to alcoholic Lugol's solution (MBL). The exact histochemical significance of selective staining of chromatin in hematogenous lymphocytes in nodes with the MBL technic is uncertain. The technic resembles Gram's stain, the basis for which also is not clear. Despite uncertainty as to the histochemistry of the technic, the findings indicate that chromatin at the level of hematogenous lymphocytes in nodes is subjected to unidentified factors during lymphatic drainage which cause it to respond specifically to the MBL technic. This fact, therefore, permits the assumption that the activities and functions of chromatin in hematogenous lymphocytes may also be subject to unique modifications from those of ordinary chromatin.—O. P. J.


In previous studies, it was shown that lymph node reticular cells were proliferating at a slow rate and showed no evidence of serving as stem cells for lymphoblasts or plasmoblasts. A more extensive study concerning the life span of cells of the reticular network and the possibility that reticular cells give rise to the free stem cells was made using control and irradiated rats. In each experimental series, the hemocytes of comparable hemopoietic organs showed essentially the same per cent label and average grain count as the experimental series, comparable hemopoietic organs showed essentially the same per cent label and average grain count as the experimental series, and irradiated rats. In each made using control and irradiated rats. In each experimental series, the hemocytes of comparable hemopoietic organs showed essentially the same per cent label and average grain count as the committed stem cells. In this respect, the radioautographic evidence was in accord with the classic concepts of cell derivation which places the hemocytes as precursors of the committed stem cells, but was in conflict with the hypothesis that hemocytes are derived from cells of the fixed reticular network.—O. P. J.


Polymorphonuclear granulocytes (PMNG) that are engaged in phagocytosis in vitro have a pronounced tendency to stick together and to form dense clumps. This paper describes the electron micrographic appearance of clumped PMNG obtained from in vitro and in vivo preparations. The results indicate that forces of electrical bonding per se are not solely responsible for the clumping together of phagocytes. It is not unlikely that the interdigitations of cell membranes from adjacent leukocytes assist in a mechanical sense in the sticking together of these cells. It is suggested that similar structural events may be operative in the adhesion of blood born leukocytes to vascular endothelium during acute inflammation.—O. P. J.


Studies were performed to ascertain if exotoxins are taken up by leukocytes by a mechanism of pinocytosis which has been demonstrated for thermostable and thermolabile neurotoxins. Leukocytes were obtained from the peritoneal exudate induced in guinea pigs by two intraperitoneal injections of 5 per cent polyvinyl pyrrolidin in aqueous solution. Pinocytosis of the diphtheria exotoxin and Dick erythrotoxin was revealed by either labeling of the toxin, fluorescent antibody staining, or the lethality test of leukocyte homogenates in guinea pigs after exposure of leukocytes to crystallized diphtheria toxin. Some bacterial exotoxins were taken up by a mechanism of pinocytosis. Crystallized Dick toxin, although it entered leukocytes, probably by osmosis, was not taken up by pinocytosis.—O. P. J.


The effects of aging on mast cells and plasmaocytes in relation to blood vessels and connective tissues in the choroid plexuses and subfornical organ were reported. The brains, including the olfactory lobes and the cerebellum, of 130 hamsters were studied. The age range was 21 to 844 days. Mast cells were absent in the thalamus of hamsters less than 200 days old. Mast cells and plasmaocytes were not found in hamsters 35 to 381 days
old. Plasma cells, but no mast cells, occurred in the subfornical organ from 500 to 775 days of age in 18 of 26 animals and in only 1 of 13 less than a year old. Histamine released from mast cells near the union of the terminal and choroidal veins may be a part of the mechanism for increasing blood flow in the deep or ganglionic blood system. On the other hand, release of histamine from mast cells dilated capillaries, a process which is often associated with passage of plasma proteins into tissue fluids. Plasmacytes form in many tissues and organs where there has been stasis of blood, lymph and tissue fluid. Antigenic stimulation of plasmacytogenesis and the concomitant increase in plasma proteins in tissue fluid, however, often has been associated with mastocytogenesis.—O. P. J.

**ERYTHROCYTES**


Heterozygotes from a Caucasian family harboring hemoglobin Chesapeake manifested moderate erythremia due to increased oxygen affinity of the pathologic hemoglobin and the presumed decreased tissue oxygenation. The observed substitution of leucine for arginine in the 92nd position of the alpha chain, which is in the vicinity of the heme-linked histidine and in an area in which alpha and beta chains interact during the spatial rearrangements of oxygenation, might explain the altered oxygen affinity and diminished heme-heme interaction of purified hemoglobin Chesapeake. (Abstractor’s note: Another hemoglobinopathy previously observed in which altered oxygen affinity has been manifested clinically was reported by Reissman, et. al., J. Clin. Invest. 40:1826, 1961. In their patient, a hemoglobin with low oxygen affinity produced impressive cyanosis.)—H. S. J.


The authors have devised an ingenious method for determining the dry weight and fat-free dry weight of single lyophilized rat peritoneal mast cells and for obtaining an average value for the protein content. The histamine values seemed reliable, but heparin and protein values were unreliable. The amount of serotonin per cell was negligible. These isolation and weighing procedures are being used as a basis for a study of lactic dehydrogenase activity of single mast cells.—O. P. J.


Hemoglobin Gower 1, thought to be a tetramer of epsilon globin chains, was found to be the predominant hemoglobin in very young human embryos. The authors suggested that epsilon chains are produced more effectively than alpha, beta, gamma, or delta chains in early life, perhaps related to different requirements for oxygen transport at this stage of development.—H. S. J.


A study of the incidence of favism in three areas of Greece suggests that overt episodes do not occur at random in G-6-PD deficient individuals, but that familial aggregation of cases occurs. The data fit the hypothesis of Mendelian segregation of an autosomal gene which in the heterozygous state enhances the susceptibility to favism of G-6-PD deficient individuals.—H. H. F.


A Negro family was described in which three brothers and a male maternal first cousin demonstrated chronic hemolytic anemia associated with absent erythrocyte and markedly diminished leukocyte G-6-PD activity. By starch gel electrophoresis, the G-6-PD migrated as a single band at a
rate of 104 per cent of normal. Physicochemical studies revealed a marked increase of the Michaelis constant for both G-6-PD and TPN, a marked instability of the enzyme at 40 and 48 C and a narrow pH optimum at 9.0. These findings were similar to those seen in Caucasians with congenital nonspherocytic hemolytic anemia and the Oklahoma I variant of G-6-PD. Two sisters and the mother of three affected brothers and the mother of the affected cousin were studied. Erythrocyte G-6-PD levels ranged between 11 and 26 per cent of normal and leukocyte levels were 35 to 63 per cent of normal. All of these women showed some evidence of a fairly well compensated hemolytic disorder.—J. B. S.

EVIDENCE FOR FOUR TYPES OF ERYTHROCYTE GLUCOSE-6-PHOSPHATE DEHYDROGENASE FROM G-6-PD-DEFICIENT HUMAN SUBJECTS. P. V. C. Pinto, W. A. Newton, Jr. and K. E. Richardson. From Ohio State University College of Medicine, Columbus, Ohio. J. Clin. Invest. 45:823–831, 1966.

Utilizing electrophoretic technics, activation energies, kinetic constants (Km) for various substrates and thermal stabilities, the authors provided evidence for four separate types of red cell G-6-PD in enzyme-deficient red cells. Deficient Negro males had one of three types, whereas Caucasian male congenital nonspherocytic hemolytic anemia patients had a fourth type.—H. S. J.


A patient with congenital, DPNH-diaphorase-deficient methemoglobinemia was observed to have red cells with a heterogeneous distribution of methemoglobin (Betke technic). Older cells contained the majority of oxidized pigment, a phenomenon shown to be related to a failure of GSH and hexose monophosphate shunt metabolism which were shown to supplement critically the deficient diaphorase mechanism in young cells. Evidence was presented that this protective mechanism represents a nonenzymatic reducing effect of GSH for methemoglobin. The segregation of methemoglobin into a minor population of (old) cells may account for the characteristic equilibrium concentrations of methemoglobin and the diminished shift in oxygen-dissociation curves and the minimal tendency to polycythemia in some patients with this disease.—H. S. J.


Stimulated by the increased utilization of hyperbaric oxygen in clinical and space medicine, the authors have investigated the metabolic correlates of hemolysis in Vitamin E-deficient mice subjected to hyperoxia in hyperbaric chambers. The studies established that membrane lipids were peroxidized in vivo prior and, therefore, possibly causally related to, hemolysis. Abnormalities in the state of hemoglobin oxidation, the hexose monophosphate shunt and glutathione homeostasis, frequent associates of hemolytic disease due to oxidant drugs, were not observed. Vitamin E supplementation was completely protective even when administered minutes before the hyperoxic stress.—H. S. J.


Seventeen cases of advanced carcinomatosis with striking degrees of red cell fragmentation were added to the five reported by Brain, et al. (Brit. J. Haemat. 8:358, 1962). Thrombocytopenia and overt hemolytic anemia were observed only sporadically. As in the previous series, the stomach and colon were the most frequent sites of the primary malignancy and most cases had evidence of metastatic disease with very brief survival after peripheral smear abnormalities were noted. The pathogenesis of red cell fragmentation was not discussed, but others have suggested that it results from mechanical trauma to red cells in capillaries partially occluded by tumor emboli. (Abstractor’s note: An especially informative case of this syndrome is discussed in a CPC by J. H. Jandl, New Engl. J. Med. 267:452, 1962.)—H. S. J.


In two cases with typical mechanical hemolytic anemia following insertion of Starr-Edwards aortic valve prostheses, striking elevations of serum iron were associated with numerous ringed sideroblasts in marrow erythroblasts and intramitochondrial accumulations of iron were noted by electron mi-
ABSTRACTS


Hematologic values were compared in 60 healthy women throughout pregnancy. One-third had no iron therapy, one-third received 1,000 cc. Imferon intravenously, and one-third received 39 mg. elemental iron (Mol-Iron) twice daily. The untreated patients dropped their hemoglobin by 2 Gm. in the last trimester and did not recover normal values for about 6 weeks after delivery. All patients developed increased plasma volumes; the treated women, however, were able to increase their red cell mass sufficiently to avoid anemia. Serum iron fell and total iron-binding capacity rose in all patients to some degree, but considerably more so in the untreated group.—R. O. W.


Falsely low values for serum iron may be obtained in patients receiving DFOM, unless a strong reducing agent in the form of powdered hydro-sulfite is added to the reaction mixture. An apparent increase in unsaturated iron-binding capacity is produced by DFOM administration.—J. B. S.


The standard technics for serum iron determination cannot be used in patients receiving DFOM. The use of atomic absorption spectrophotometry gives valid data regarding the total serum iron and the total bound iron. From these data, the concentration of free ferric ions can be calculated, permitting improved regulation and evaluation of DFOM therapy.—J. B. S.


A newborn infant with severe iron deficiency anemia due to protracted fetomaternal hemorrhage is described. The differences in clinical and laboratory findings between newborns with acute and chronic transplacental hemorrhage are described and the therapy of each type of patient is discussed.—J. B. S.


Hemoglobin concentration was less than 10 Gm. per cent in 239 of 1,052 consecutively-studied pregnant subjects. Determination of serum concentrations in 130 of these anemic cases showed subnormal values for iron in 80 per cent, for folate in 65 per cent, and for vitamin B12 in 31 per cent. Subnormal concentrations of more than one factor were detected in 73 per cent of patients studied.—F. A. K.


In weanling rats given a maize diet deficient in protein and amino acids, as well as folate and vitamin B12, severe depletion of liver folate and vitamin B12 concentrations occurred within 6 weeks. This depletion was reflected by a fall in serum vitamin B12 levels, but serum folate levels remained normal. Supplementation of the diet with vitamin B12 prevented depletion of both vitamin B12 and folate in the liver, but was associated with a decrease in the serum folate activity. These observations indicated that serum folate determinations may not be a valid index of folate depletion in some instances where concomitant deficiency of vitamin B12 is present.—F. A. K.


Schilling tests were done in twelve tapeworm carriers. Mean excretion was 2.7 per cent. Three days later, the test was repeated with 5–25 mg. of folic acid added. The mean excretion now was 5.7 per cent. Eleven other patients were given
cerned the red cells series since this is the predominant intravascular and extravascular stem cell of the reticulocyte and granulocytic series, respectively, was noted. Angioblasts gave rise to the intravascular blood islands, not by a process of intracellular liquefaction but by an enlargement and coalescence of intracellular spaces.—O. P. J.


Reticulocytes, obtained from adult rat blood after phenylhydrazine had been injected daily for a week, were studied by light, phase and electron microscopy, ultracentrifugation and supravital methods. The results reported were, for the most part, consistent with those found by other investigators. Additional information about the fine structure and physical nature of the reticulocyte was provided. Stratification upon ultracentrifugation in accord with relative specific gravity was revealed, as well as evidence of a cortex with a much higher viscosity than the rest of the cell. This finding may be important in the formulation of theories concerning the shape of red cells. Certainly, the reticulocyte is something more than a sac containing hemoglobin.—O. P. J.


The authors support the interpretation that the pebbly or granular surface appearance is not an artifact, but is directly related to the structure of the erythrocyte surface as it exists when the cell is suspended in buffered physiologic saline solution. They also report some filamentous structures seen only in special unshadowed preparations of the cell surface. Obviously, more information is needed about the effects of surface fixing and staining agents on the molecular structure of membranes.—O. P. J.

HEMOSTASIS


tritiated folic acid orally prior to worm expulsion. The worms were expelled and assayed for tritium activity. Uptake of folic acid could not be demonstrated. It was hypothesized that the worm excretes a substance which inhibits the postulated function of folic acid in the transport of vitamin B₁₂ through the intestinal wall.—S.-A. K.


Three children were described in whom pancytopenia developed during or within two months after what appeared to be moderately severe infectious hepatitis. One patient died of sepsis, the other two had apparent hematologic responses to therapy with testosterone and prednisone. The authors postulated that aplastic anemia following infectious hepatitis may represent the more severe expression of a transient, viral-induced depression of hematopoiesis which occurs in many patients with this disease.—J. B. S.


One group of sheep was treated with phenylhydrazine, another group with nitrogen mustard followed by phenylhydrazine. Plasma (unfractioned) from the latter group contained about twice as much erythropoietin as plasma from the former one.—S.-A. K.


Electron microscope observations on the development of the first blood cells in the area vasculosa of chicken embryos to 7 days of incubation were described. The bulk of the findings concerned the red cells series since this is the predominant blood cell type during this period. The observations both confirmed and contradicted previous light microscope findings. No evidence for the endothelial origin of blood cells was observed; however, the sampling problem inherent in the use of thin sections must be considered in this respect. A structural similarity between the intravascular and extravascular stem cell of the
ABSTRACTS

Another case, this one with small cell lymphoma, was added to the list of patients with autoimmune hemolytic anemias who seem to respond to heparin therapy. The patient had a dramatic increase in circulating hemoglobin and complement levels coincident with the administration of 300 mg. heparin daily. Well controlled studies of many such patients seem in order.—H. S. J.


Plasma acid phosphatase levels were normal in three children with Wiskott-Aldrich syndrome, as was the survival of transfused homologous platelets. This study was the second in which the thrombocytopenia in this disease was not related to increased peripheral platelet destruction.—J. B. S.


Malignant reticuloendotheliosis and/or myelogenous leukemia developed in two of four brothers with the Wiskott-Aldrich syndrome. Five additional instances of reported neoplasia associated with this disorder were reviewed; one was a brain astrocytoma and the others also involved the reticuloendothelial system. A relationship between R-E neoplasia and the Wiskott-Aldrich syndrome appears probable and may relate to the stimulatory effect of the repeated infections on the R-E system.—J. B. S.


The biological half-life of $^{131}$I-fibrinogen after intravenous administration in man was determined. In 19 normal subjects, distribution equilibrium was attained after about 76 hours; the intravascular portion appeared to be 54.4 per cent. Thereupon, disappearance occurred exponentially with a t½ of 110 ± 11 hours. In a patient with elevated body temperature, the t½ was shortened to 50 hours, whereas in a patient suffering from myxedema, the t½ appeared to be considerably prolonged, 194 hours. In 10 patients with impaired blood coagulation (congenital defects or anticoagulant treatment), the biological t½ was 107 ± 10. Streptokinase lowered the t½ of labeled fibrinogen, whereas administration of epsilon-amino caproic acid (oral dose: 15 Gm. daily) resulted in a prolongation of the survival time up to twice normal. The biological t½ of $^{131}$I-fibrinogen in 9 patients with hypercholesterolemia ranged from 92 to 132 hours, averaging 113 hours. In six patients with clinically pronounced atherosclerosis, the respective values were 74–115 and 94 hours. In three of these patients, t½ increased slightly but not significantly during anticoagulant treatment. A decrease in the t½ was most pronounced in patients with metastatic carcinoma. There was a clearcut short survival time in 3 of 4 patients with polycythemia vera, in one of whom the t½ increased from 57 to 125 hours under treatment with heparin and the fibrinogen level rose from 150 to 320 mg. per cent. It was concluded that these findings argued in favor of a physiologic, continuous fibrinolysis in vivo with intravascular coagulation occurring only under pathologic circumstances.—E. A. L.

MISCELLANEOUS


Kernicterus is believed to result from the toxic effect of bilirubin on neuronal metabolism, particularly with regard to oxidative phosphorylation. The uncoupling effect of bilirubin on mitochondrial suspensions can be reduced by the addition of albumin which binds bilirubin and prevents its attachment to the mitochondrion. Odell demonstrates that the association of bilirubin with mitochondria increases progressively when the molar ratio of bilirubin to albumin exceeds unity. Mitochondrial uptake of bilirubin is increased by hypertonicity or by the presence of organic anions, such as salicylate, which compete with bilirubin for the available albumin, particularly when the molar ratio of bilirubin to albumin is above one. Swelling of the mitochondria is seen when bilirubin is added to mitochondrial suspensions, and this can be prevented by the addition of albumin.—J. B. S.

The data reported indicated that hematologic changes do occur beyond sexual maturity in the domestic farm animals studied and, while they were not all consistent with hematologic changes occurring with variations of adrenocortical function, they emphasized age considerations when evaluating hematologic data.—O. P. J.


The influence of various concentrations of human \(\gamma\)-globulin (HGG) employed to sensitize tanned sheep erythrocytes on hemagglutination titres with various early and late mouse and rabbit antisera to HGG has been studied. The concentration of HGG employed to sensitize erythrocytes which gave the highest hemagglutination titres with early, mercaptoethanol-sensitive antibodies was not optimal for obtaining the highest hemagglutination titres with late, mercaptoethanol-insensitive antibodies. Similar results were obtained with heavy and light sucrose gradient ultracentrifugation fractions of a late and early rabbit antiserum. These findings may account for past discrepancies and should be considered when employing the hemagglutination test to detect early and late antibodies.—H. H. F.


The author developed and applied a direct and indirect serum-gelatin test for detection of the classic incomplete isoimmune maternal antibodies in the blood of neonates with hemolytic disease and of autoimmune antibodies in the blood of patients with blood disorders. The serum-gelatin test proved to be much more sensitive in respect to the classic incomplete antibodies than was the Coombs' test.—J. K.


Two cases with anti-Kell antibodies were described. These antibodies were formed as a result of pregnancy. The sera were active in conglutination with gelatin and in the Coombs antiglobulin test. The frequency of the Kell factor was investigated.—J. K.


An unusual paraprotein of very rapid electrophoretic mobility and \(\gamma\)A antigenicity was found to have its L chain antigenicity obscured or hidden, although associated Bence Jones protein in the urine exhibited easily demonstrable specificity. The intact protein was not tappable with anti-\(\kappa\) or anti-\(\lambda\) sera and, when injected into rabbits, failed to provoke either anti-\(\kappa\) or anti-\(\lambda\) response. Mercaptoethanol reduction of the protein revealed a normal proportion of L chains which were readily shown to have \(\lambda\) specificity and which had an acid-urea-starch-gel electrophoretic mobility identical to that of the reduced Bence Jones protein. The isolated L chains provoked a \(\lambda\)-specific response when injected into rabbits. The reduced and alkylated paraprotein (its L and H chains not yet separated by a id Sephadex filtration) was readily tappable as \(\lambda\)-specific when the same typing sera was employed which failed entirely to react with the unreduced whole protein. Five other \(\gamma\)A myeloma proteins showed enhanced precipitation with \(\kappa\) and \(\lambda\) typing sera after mercapto-ethanol reduction of the paraproteins. It was concluded that the atypical antigenic properties displayed by the paraprotein described in this report probably reflected structural features producing steric hindrance against reaction with homologous antibodies.—H. H. F.


Using a radial diffusion plate method, immuno-globulin levels in healthy and sick infants, children and adults were determined. No differences were noted between colored and white subjects. The level of IgG fell from somewhat below normal adult values in the cord blood (1031 ± 200 mg per cent) to a mean of 430 mg./100 ml. at three...
months, and then rose rapidly over the next two years, after which the levels rose more slowly, reaching normal adult means after the eighth year. The levels of IgM in cord blood were between 5 and 30 per cent of the adult values (99 ± 27 mg. per cent) and rose progressively, reaching 60 per cent of normal adult levels by one year, but remaining below 85 per cent throughout childhood. Only one-third of the cord bloods studied contained trace amounts of IgA, but small amounts of IgG were present in all sera by 3 weeks of age. The levels of IgA rose slowly during childhood, but mean values remained below 75 per cent of adult levels (200 ± 61 mg. per cent) until after adolescence. Among mongols, immunoglobulin levels were in the normal range until 5 years, after which IgG and IgA levels were significantly elevated and IgM levels were somewhat depressed. In older children and adults with mongolism, the total γ-globulin levels were above normal. Among patients with other chromosomal abnormalities, variations in immunoglobulins were variable without a consistent pattern. In patients with non-leukemic neutropenias, all immunoglobulins were elevated.—J. B. S.

Serum Immunoglobulin Measurement during the First Year of Life and in Immunoglobulin Deficiency States. V. A. Fulginiti, O. F. Sieber, Jr., H. N. Claman and D. Merrill. From the University of Colorado Medical Center, Denver, Col. J. Pediat. 68:723-730. 1966.

Using a capillary immunoprecipitation technic, immunoglobulin assays were performed on paired maternal-cord blood specimens, and at intervals during the first year. Mean IgG levels in maternal and cord blood sera were fairly close to normal adult values, although the relationship between individual mothers and their offspring varied. IgA was detected in only one of 18 cord specimens; IgM was found in 75% of the cord bloods. The range of IgM values in this group of newborns was very similar to that reported in the paper by Stiehm and Fudenberg (abstracted above) and the levels reported for all three immunoglobulins during the first 6 months also were similar. At one year of age, the mean IgM level was 100 mg./100 ml., a value almost twice that reported above, but the normal adult value in this paper was also approximately twice that found by Stiehm and Fudenberg. Thus, the IgM level at one year was 60 per cent of adult values in each report. Mean IgA and IgG levels at one year were similar in both papers. Immunoglobulin levels in a small group of patients with immunoglobulin abnormalities also were reported.—J. B. S.


Immunologic differences among Bence-Jones proteins within each major type have been correlated with the peptide maps of individual proteins. Single peptide differences among different proteins of the same immunologic type may determine some of the subtype heterogeneity. The theoretical relationship of this heterogeneity to the mutable amino terminal end of the molecules is discussed.—H. H. F.


The small amount of γ-D (IgD) in the sera of these patients did not react with antisera specific to the heavy chains of γ-G, γ-A and γ-M immunoglobulins. This abnormal protein may not be clearly evident on paper electrophoresis, but can be detected by means of an anti-γ-D serum. The incidence of γ-D was found to be about 3 per cent (6 in 204 patients with myelomas) and was of type L. Myelomas of γ-D type resembled γ-A types with regard to the low serum-level and short half-life of the myeloma protein, the degree of loss of normal immunoglobulins and predisposition to infection and associated hypercalcemia and amyloidosis. There was associated heavy Bence-Jones proteinuria (average 6.5 Gm. per day) and, therefore, renal failure dominated the prognosis.—P. B.


Twenty-one cases of primary and 31 of secondary drug-induced aplastic and hypoplastic pancytopenia were analyzed. The prognosis of primary aplastic pancytopenia was worse than that of secondary pancytopenia. In drug-induced pancytopenia, impaired hematopoiesis sometimes per-
sisted for several years. One primary and one secondary case of aplastic anemia changed into a hemoblastosis. Remission in the course of aplastic pancytopenia need not necessarily signify permanent cure and may be followed by a fatal attack.—L. D.


Histochemical examinations of alkaline and acid phosphatase and ATP-ase activities were performed in livers, kidneys and intestines of rabbits poisoned with lead acetate. Inhibition of alkaline phosphatase in the intestines and of acid phosphatase in the livers and in the loops of Henle of the kidneys was found. Diminished intensity of reaction for ATP-ase was observed in the small intestine and in the sigmoid colon. The observations provided a possible explanation for the abdominal colic in lead poisoning.—E. K.


A method is described for producing bimolecular protein-phospholipid membranes in aqueous solution. An absorption film is formed on the interface between a solution of protein in water (egg albumin) and a solution of phospholipid in heptane. In this film, the hydrophobic ends of the protein and lipid are oriented towards the water. A similar film is brought up to the first film from the heptane side. The two films then become enclosed by their hydrophobic ends and form a thin bimolecular protein-lipid membrane separating two aqueous solutions. The authors suggest that by suitable selection of proteins, lipids, solvents and salts a model membrane with properties close to those of cell membranes probably could be produced.—P. B.


The secretor status of 86 Bushmen was tested. The subjects, who live in Botswana, follow a hunting and food-gathering way of life. Two nonsecretors were found, giving a gene frequency for the nonsecretor gene of 0.048. The only other groups which have been found to have similar low gene frequencies are American Indians and Eskimos. These results suggested that nonsecretors are at a selective disadvantage in culturally primitive populations.—T. H. B.


Saline agglutinating anti-Rho(D) sera fixed complement with Rho(D) positive stroma, as well as with hr(d) negative stroma. Fixation did not occur with intact red cells from which the stroma was derived or with red cells containing larger amounts of Rho(D) antigen (-D-). The authors assumed that the spatial arrangement of the antigen involved was altered in stroma so that its antigenic sites were available for the interaction with antibody molecules leading to complement fixation.—P. B.