ERYTHROCYTES


Glutathione reductase of erythrocytes is a remarkably stable enzyme. Citrated blood, stored for 2 months at 4°C showed a slightly increased activity of this enzyme, and activity could be readily demonstrated in hemolysates kept at -30°C for several years. The activity of the enzyme allows thus for no conclusion as to the age of a red cell population.—H.-J.H.

ACTIVITY OF IRON-CONTAINING ENZYMES IN ERYTHROCYTES AND GRANULOCYTES IN THALASSEMI A AND IRON DEFICIENCY. A. L. Sagone, Jr., and S. P. Balcerzak. Division of Hematology and Oncology, Department of Medicine, The Ohio State University College of Medicine, Columbus, Ohio. Amer. J. Med. Sci. 259: 350-357, 1970.

Red cell catalase is decreased in iron deficiency and thalassemia minor and therefore not related to hypochromia or microcytosis. Catalase activity in granulocytes was normal in both iron deficiency and thalassemia minor. Erythrocyte nucleoside phosphorylase, an enzyme not requiring iron was elevated in thalassemia, but normal in iron deficiency. Red cell enzyme changes in thalassemia may be nonspecific, but in iron deficiency they are related to iron decrease.—R.O.W.

ABSTRACTS

Red cell survival, as measured with $^{51}$Cr, was shortened in severe iron-deficiency anemia. Red cells were sequestered in the spleen. Severely iron-deficient red cells had increased hexokinase activity. ATP was not elevated and was unstable. Normally, young cells have elevation of both hexokinase and ATP. The authors speculate that excessive energy may be required to maintain red cell shape.—R.O.W.


Fifty-seven children with congenital cyanotic heart disease were examined (26 after the Bullock-Taussig operation). Serum iron levels were within the normal range while the total and latent iron-binding capacity values were increased in about 30 per cent of cases. The absorption of iron from the gastrointestinal tract was increased in 47 per cent of patients. Latent iron deficiency was recognized as a cause for the increased binding capacity and absorption of Fe. The deficiency occurred more frequently in nonoperated patients. —M.K.


Combined oral treatment with calcium disodium versenate and iron gluconate was applied to 23 patients with iron deficiency anemia caused by impaired iron absorption. It was found that Na$_2$Ca-EDTA increased significantly absorption of Fe from the gastrointestinal tract. Normalization of erythropoiesis occurred sooner after this type of therapy than after treatment with iron preparations only.—M.K.


In the spleen of the polycythemic mouse, erythroblasts appeared 24 hours after erythropoietin injection in vivo or after 24 hours of incubation with erythropoietin in vitro. Simultaneously with the appearance of erythroblasts, the spleen started to incorporate radioactive iron into heme. The activity of ALA-synthetase became demonstrable in the spleen of the polycythemic mouse after erythropoietin injection. Appearance of ALA-synthetase activity was completely inhibited by the prior injection of actinomycin D. Induction of ALA-synthetase by erythropoietin might regulate the differentiation of erythroid cells from hematopoietic stem cells. By incubating spleen cells with $^3$H-uridine, $^3$H-thymidine, and $^3$H-acetate, it was found that prior to the appearance of ALA-synthetase activity, increased synthesis of RNA and DNA, and increased acetylation of histones took place in the hematopoietic organs of the polycythemic mouse after erythropoietin injection. The accelerated histone acetylation and the increased DNA synthesis preceded the increase in RNA synthesis. Experiments performed to clarify the mechanism involved in the increased RNA synthesis revealed that after erythropoietin injection chromosomal RNA-polymerase activity was increased. Nucleolar RNA-polymerase activity and template activity of the chromatin were not altered or only slightly decreased after erythropoietin injection. From these observations, the existence of activated as well as inactivated genes in the process of erythroid cell differentiation was speculated. The possibility of inhibition of the template activity by hemoglobin in erythroid cells was investigated by measuring the template activity for RNA synthesis of the chromatin of erythroid cells in the presence of hemoglobin. Hemoglobin amounting to 16 mg./ml. did not cause any decrease in template activity, while histone at the concentration of 400 µg./ml. caused a marked inhibition of it.—K.F.


Sheep milk was examined for the presence of erythropoietin. Erythropoietic activity of milk and plasma was determined
by a biological test (incorporation of 59Fe into blood, bone marrow, spleen and liver of starved rats and of rats with post-transfusion polycythemia). Sheep milk showed erythropoietic activity if obtained from sheep in the first period of lactation or if experimental anemia was induced during the lactation period. Erythropoietin passes from the plasma to the milk. Hypoxia led in the lactating sheep to an increased content of erythropoietin in the milk and to the transfer of erythropoietin to the progeny.—M.K.


Studies were performed on the fate of transplanted bone marrow cells by the original method of Till and McCulloch (1961), following the development of the most immature stem cells to mature blood cells in the spleen of recipient mice. Supralethally irradiated C3H/He mice were injected with normal bone marrow cells from the same strain. The process of differentiation from stem cell to erythrocyte cell was accomplished in 5 days. This value was derived from the results obtained by comparing the weight and the radioiron uptake in the spleens of the recipient animals with that of nongrafted control rats at varying time intervals after transplantation. The process of differentiation from stem cell to erythropoietin-responsive cell needed 3 days. This value was calculated from the time of detection of erythrocyte cells in the spleens of the recipient animals after challenge with erythropoietin given at various time intervals after bone marrow injection using transfusion-induced polycythemic recipients. The growth pattern of the stem cells in the recipients' spleens was also estimated by retransplantation of recipients' spleen into a second irradiated recipient. Colony-forming cells had a doubling time to 55 hours after an initial lag phase of 3 days after transplantation and proliferated in a fashion completely different from that of erythropoietin responsive cells. The suppressive effects of colchicine, graded doses of X irradiation and of actinomycin D on the maturation process were measured by administering these agents immediately after transplantation. The data of time course studies of DNA and RNA synthesis in recipients' spleens using 3H-thymidine and 3H-uridine and liquid scintillation counting techniques were also consistent with the experimental results obtained from the cell kinetic studies. Three days after transplantation, the appearance of large mononuclear cells with fine nuclear structure was impressive when compared with the nongrafted controls. Four days after transplantation, deep basophilic cells appeared and were heavily labeled in the autoradiograms with 3H-thymidine. Five days after transplantation, polychromatic erythroblasts could be identified.—K. F.

LEUKOCYTES


A formation of basophilic pseudogranules was observed in tissue cultures of human leukocytes in Eagle's medium with 20 per cent of autologous serum, traces of heparin and 100 µg per ml. of Neomycin. These pseudogranules were found in monocytes and in some of leukemia blasts in vitro and on cytochemical investigations yielded results similar to those of granules of normal blood basophils, e.g., purple metachromasia after basic dyes and positivity of reactions for mucopolysaccharides and phospholipids.—L. D.


To cultures of peripheral blood leukocytes obtained from patients with acute myeloblastic and histomonocytic leukemia was added serum from the same patients taken at the time of relapse and remission;
controls with normal sera vs. leukemic cells and normal sera vs. normal cells were used. Acute leukemia serum had a lytic effect upon healthy and leukemic leukocytes, this property being lost after storage for 5 days at both +2°C. and −20°C.; serum from chronic leukemia patients had no such effect. This reaction might provide the basis for a diagnostic test for acute leukemia. —I. V.


The administration of material derived from patients with acute leukemia and chronic myeloid leukemia (whole blood, plasma, leukocyte concentrates and bone marrow) into rhesus monkeys was followed by transient changes in the blood, including moderate hypochromic anemia, changes in the differential leukocyte count, and bone marrow hyperplasia with some increase in undifferentiated elements. Planned transplantation of marrow also produced no consistent hematologic changes.—J. V.


The author attempts to analyze and assess some aspects of morphopathogenesis in cases of acute leukosis from the standpoint of cell kinetics. The main peculiarity of a group of cells affected by leukemia is the absence of uniformity in their behavior: part of the cells retain their ability to divide, multiplying at a normal rate; whereas a number of other cells do not divide and have a protracted lifespan. The author suggests that a constant exchange of cells between these two subgroups, as well as their interrelations, define, to a certain extent, the variety and the course of an acute leukosis. For example, an increase in the number of dividing cells may possibly be behind the development of the tumor-like varieties of acute leukosis, whereas a decrease in their number, in all probability, preconditions a remission. Considering the causes of leukemic hyperplasia, the author finds erroneous the concept of a rapid increase of proliferation in cases of acute leukosis. However, the author objects to defining hyperplasia as nothing but a process of accumulation of leukemic cells with a long lifespan, their proliferation rate being slowed down. The author suggests that leukemic hyperplasia is the result of an increase in the number of mitotic cycles in the dividing subgroup of cells, accompanied by an accumulation of cells with a protracted lifespan in the nondividing cell group. The paper considers all the possible kinetic relationships between the dividing and the nondividing affected groups of leukemic cells.—J. K.


Twenty-nine patients with different types of leukemia were treated with Delbiase a mixture of magnesium chloride, bromide, iodide and fluoride (Grimaut Laboratory, Paris). In chronic lymphatic leukemia improvement was observed after 3 weeks of treatment. The size of the lymph nodes and spleen as well as lymphocytosis decreased, whereas erythrocyte, neutrophil and platelet counts increased. In other types of leukemia, Delbiase did not induce similar effects.—M. K.


Pulmonary changes were observed in 21 of 60 patients with Hodgkin's diseases treated by irradiation during the period 1959-1966. Bronchovascular forms of infiltration occurred in four cases, subpleural
infiltrations in 10, mixed forms in four and massive infiltrates in five. In two cases, pulmonary cavities were found. All patients with pulmonary changes deceased within two years.—M.K.

**CHANGES IN K AND Na LEVELS IN BLOOD SERUM DURING TREATMENT WITH CYCLOPHOSPHAMIDE.** J. Stadnik and A. Podwinski. The Third Department of Surgery, Silesian School of Medicine, Bytom, Poland. Pol. Tyg. Lek. 25:134-137, 1970.

Cyclophosphamide administration was shown to induce changes in serum K and Na concentrations in normal rabbits and patients with neoplasms. A decrease of serum Na and an increase of K were observed.—M.K.

**HEMOSTASIS**


The authors compared the therapeutic effectiveness of platelets obtained from random donors with those obtained from compatible donors selected from family members on the basis of HL-A genotypic identity. Patients with aplastic anemia received a median of 19.3 units/sq M. of body surface area of platelets from random donors and all eventually became refractory to these platelets within a median time of 8 weeks (range, 5-26). This refractoriness was not improved by splenectomy. By contrast, there was no evidence of loss of response to compatible platelets. When HL-A typing is not available and refractoriness to platelets is life threatening, family members, particularly siblings, can be tried empirically as platelet donors.—H. J. W.


The authors stored platelet concentrates, prepared from nonacidified ACD-blood, at 4°C and 22°C and studied the effect of storage time and temperature on the recovery of the transfused platelets and on their ability to circulate for 24 hours. When platelets which had been stored for 24 hours were transfused into patients with thrombocytopenia (causes unstated) a recovery of 80-90 per cent was obtained and it mattered little whether the platelets had been stored at 4°C or 22°C. However, the platelets which had been stored at 22°C survived better. At 24 hours post-transfusion, the number of these platelets which were still circulating was only 20 per cent less than was obtained when fresh platelets were used. By contrast, only half this number of circulating platelets were obtained in patients who had received concentrates stored at 4°C. *Abstractor's comment:* In all cases, the question of the functional integrity of the platelets remains unanswered.—H. I. W.

**THROMBOTIC CHANGES IN ACUTE PANCREATITIS IN MAN.** B. Musiatowicz, I. Popow and A. Gabryelewicz. Faculty of Anato...
mopathology and 2nd Department of Internal Medicine, School of Medicine, Białystok, Poland. Pol. Tyg. Lek. 25:59-61, 1970.

Detailed histological examinations in 20 fatal cases of acute pancreatitis with a fulminant course showed thrombotic changes in many organs. In 15 cases, multiple thrombi were found in capillaries as well as in small arteries and veins of the pancreas, in 10 cases there was recent thrombotic obliteration of the coronary arteries, in nine cases thrombi were present in the pulmonary vessels. The occurrence of thrombotic changes was less frequent in the liver (three cases) and kidneys (two cases). Edema and minute hemorrhages, but not thrombi, were observed in the brain. The results support the opinion that diffuse intravascular coagulation due to the release of proteolytic enzymes into the blood stream play an important pathogenetic role in the clinical syndrome and the tissue changes observed in acute pancreatitis.—M. K.


Isolation of cerebral and general circulation, and autotransplantation of the kidney on one of the carotid arteries were used as models for the study of the role of cerebral and renal hypoxia on activation of fibrinolysis in dogs. It was found that ischemia in the denervated, transplanted kidney remains without influence on the fibrinolytic system, while cerebral hypoxia activates fibrinolysis.—M. K.


Fatal, acute hemorrhagic diathesis is described in a 15-year-old boy with Down's syndrome. The diagnosis of consumption coagulopathy due to intravascular activation of coagulation was established on the basis of laboratory investigations and the presence of fibrin deposits in the kidney glomeruli. Recurrent mycobacterial sepsis and release of products of disintegration of mycobacteria into the blood stream was considered by the authors as the probable pathogenetic mechanism for the reaction, similarly to the Shwartzman phenomenon, because tuberculin is known to possess endotoxin-like properties.—M. K.


In only three of 157 autopsies on patients dying of acute leukemia were microthrombi noted, but on microscopy, thrombosis was seen in the small blood vessels in 45 cases, the thrombi being multiple and extensive in 15. The microthrombi consisted largely of fibrin coagulates and were mostly localized in the small vessels of the lung and in the glomerular capillaries; less frequently they occurred in the sinusoidal capillaries of the liver, the splenic sinuses, and other organs. Extensive microthrombosis was only seen in cases of acute myeloid leukemia in which all the blast cells had been seen to contain numerous azurophilic, oxidase-positive granulations; in these cases the clinical course had been fulminant with severe hemorrhages which, in most cases, had caused the patient's death. It is assumed that the oxidase-positive leukemic cells contain substances promoting disseminated intravascular coagulation.—J. V.

The injection of 1.2 per cent and 6.0 per cent EACA into 34 healthy students was observed to reduce the plasma heparin tolerance and to increase the plasma recalcification, prothrombin and thrombin times. These solutions possess a powerful fibrin stabilizing and antifibrinolytic activity. In the treatment of surgical and obstetrical conditions in which fibrinolysis occurs as a secondary adaptive reaction to disseminated intravascular coagulation, the authors feel that EACA should be used in combination with heparin and only in life-threatening situations. They suggest that the main use for EACA is in cases of overdosage of fibrinolytic preparations and for the inhibition of local fibrinolysis.—J.V.

**EPSILON-AMINOCAPROIC ACID (EACA) IN THE TREATMENT OF EXCESSIVE MENSTRUAL BLEEDING IN GIRLS WITH CHRONIC THROMBOCYTOPENIA. R. Rakickamilewska. First Department of Pediatrics, School of Medicine, Warsaw, Poland. Pediat. Pol. 45:323-327, 1970.**

The results of EACA treatment of excessive menstrual bleeding in girls with chronic thrombocytopenia are described. EACA was administered in doses of 0.075-0.1 Gm./Kg. of body weight every 4 hours during 7 days. The first dose was injected intravenously, then the drug was administered orally. In all cases, a rapid normalization of menstrual bleeding was observed. Prophylactic treatment starting from the first day of menstrual bleeding and continued until the third or fourth day after it stops is advised by the author.—M.K.

**THE EXPERIENCE WITH THERAPEUTIC AND PROPHYLACTIC APPLICATION OF EACA IN THE MANAGEMENT OF POSTOPERATIVE HAEMATURIA. A. Utikalova, J. Procházk, R. Podivínský. Department of Medicine, University Olomouc, Czechoslovakia. Acta Univ. Pal. 01. 50:197-212, 1968.**

Postoperative hemorrhage in 25 patients suffering from adenoma of the prostate was followed after prophylactic application of ε-aminocaproic acid in a total dose of 28-104 Gm. (average dose being 68 Gm. The losses of blood during the first 6 days after the operation varied between 15-150 ml. (average loss 75 ml.). In the control group they were between 87 and 720 ml. (average loss 262 ml.). The greatest differences between the two groups were observed during the first 3 days after the operation. The level of fibrinogen rose the second and third day after the operation. This increase was greater in the group treated with ε-ACA. The euglobulin fibrinolysis time shortened immediately after the operation.—L.D.

**STUDIES ON THE FIBRINOLYTIC ACTIVITY OF BLOOD IN DIABETICS. M. Bielawiec, A. Perzanowski and M. Myśliniec. The First Department of Internal Medicine, School of Medicine, Białystok, Poland. Pol. Tyg. Lek. 25:85-87,1970.**

Distinct inhibition of the blood fibrinolytic system was found to be a frequent symptom in diabetic patients. In patients with impaired activity of the fibrinolytic system a more frequent occurrence of electrocardiographic changes suggesting myocardial ischemia and damage was observed. The mean time of dissolution of euglobulin clots in a group with abnormal ECG was nearly twice as long as in a group without ECG changes. Fibrinolytic activity of the blood in a group treated with insulin did not differ from that of a group treated with diabetol.—M.K.

**ADHESIVENESS AND AGGREGATION OF PLATELETS IN DIABETICS. J. Chmielewski. The Second Department of Internal Medicine, School of Medicine, Białystok, Poland. Pol. Tyg. Lek. 25:246-248,1970.**

Adhesiveness of platelets to glass and aggregation induced by ADP were examined in 34 diabetics. Both adhesiveness and aggreagability of platelets were found to be enhanced. A direct relationship between increase of platelet adhesiveness and level of serum beta lipoproteins and cholesterol was observed, while no correlation of this type was found for platelet aggregability.—M.K.

ABSTRACTS

In a study of 25 patients with chronic lymphocytic leukemia (ages 43–73 years) with hemorrhagic complications, studies of the coagulation system and of excretion of 17 ketosteroids and oxytocic steroids were made before and after treatment by various therapeutic agents. These were prednisolone alone; prednisolone and radiotherapy; prednisolone, radiotherapy and cytotoxic drugs (leukeran, cyclophosphor or dergenol); and prednisolone and cytotoxic drugs. All but one patient enjoyed full clinical remission, including disappearance of the hemorrhagic manifestations. The studies indicated that the patients had a hypocoagulant state due to a reduction of coagulation factors and platelets, and an increase in anticoagulant activity. This seemed to be related to reduced adrenal cortical activity due to dystrophic cortical changes; therapeutic remission was largely associated with antiheparin and the vasosupportive effect of glucocorticosteroids.—J.V.


Of nine different coagulation tests, the thromboplastin screening test according to Hicks and Pitney and the kaolin activated partial thromboplastin time according to Proctor and Rappaport were proved to be the most sensitive screening tests for hemophilia. These were abnormal in all 28 patients examined. The blood clotting time by the method of Lee and White was normal in 25 per cent of the patients, the prothrombin consumption test in 18 per cent and the thromboplastin generation test showed border-line values in one patient (7%). The author suggests the partial thromboplastin time as the most suitable test for routine practice because of its simplicity and its adaptability for mass screening.—L.D.

THROMBOPLASTIC ACTIVITY OF LEUKEMIC EOSINOPHILIC BLOOD CELLS. J. Lisieciwicz and J. Okulski. The Third Department of Internal Medicine, School of Medicine, Kraków, Poland, Pol. Arch. Med. Wewn. 44:127-133,1970.

Extracts of eosinophilic leukocytes isolated from the blood of a patient with eosinophilic leukemic reticulosis were studied. The extracts exhibited thromboplastic activity as demonstrated by shortening of the clotting time of recalcified plasma and of the r value in the thrombelastogram as well as by increasing prothrombin consumption. The extracts could also replace platelets in the thromboplastin generation test. They possessed slight antithrombin activity, but no antithrombin activity.—M.K.

IMMUNOHEMATOLOGY


Lymphocyte cultures from 30 patients with nonmalignant diseases treated with immunosuppressive drugs (6-mercaptopurine or azathioprine) showed normal lymphocyte transformation with phytohemagglutinin and with streptolysin. The immunosuppressive effect of long-term treatment with purine antimetabolites in doses of 1.5–2.0 mg./Kg. could thus not be demonstrated by this method of investigation.—H.-J.H.

(1) Transfer of antibody production by lymphocyte transplantation. Living lymphocytes displayed the capacity to transfer antibody formation from sensitized donor animals to nonsensitized and immunologically mature recipient animals. This capacity of the lymphocytes was dependent on the strength of the sensitization and on the number of lymphocytes transferred, but was independent of the amount of antibodies contained in the lymphocytes which were transferred. Antibodies produced in the recipients showed the same antigenic specificity and type-specificity as those in the donors. (2) The capability of lymphocytes for immunoglobulin production. By skin testing, it could be shown that sensitized lymphocytes exhibited the ability to neutralize the respective antigens in vitro. Fluorescent antibody technique was applied to lymphocytes to demonstrate immunoglobulins within the cells. No fluorescence was generally found within lymphocytes in the normal human blood and in bone marrow preparations. These lymphocytes, when cultured with the addition of PHA, showed fluorescence of IgG, IgA and IgM. A certain group of lymphocytes from patients with chronic lymphatic leukemia, Hodgkin’s disease and lymphosarcoma showed clear fluorescence. Thoracic duct cells from rats injected with sheep erythrocytes were identified as antibody-producing cells by their ability to make plaques of hemolysis in erythrocyte-containing agar layers. Most of the antibody-producing cells were lymphocytes and a few were plasma cells. (3) Antibody production promoting activity of lymphocytes. Administration of extracts of lymphocytes from the thoracic duct lymph and from lymph nodes which were disrupted by freezing and thawing or ultrasonic vibrations were found to promote antibody production. Activity of the sensitized cells was antigen-specific and was stronger than that of nonsensitized cells. Fraction analysis of the cell homogenate obtained by differential centrifugation showed that the activity was in the microsomal RNA. (4) Autoimmune diseases and chromosome aberrations of lymphocytes. Chromosome abnormalities of number and structure were frequently found in lymphocytes from S.L.E. patients when cultured in vitro with PHA. Moreover, the addition of disrupted lymphocytes from patients with S.L.E. and other autoimmune diseases to blood cultures of normal lymphocytes gave rise to a significant increase of numerical and structural aberrations of chromosomes.—K.F.


Lymphocytes from 30 healthy people and patients with lymphatic leukemia, Hodgkin’s disease, lymphosarcoma, histiocytic reticulosis and plasmocytic reticulosis, were studied after PHA stimulation in in vitro cultures. The activity of all examined enzymes increased during blastic transformation of the lymphocytes. In chronic lymphatic leukemia the delay in both transformation and increase of enzymatic activities was observed. An increase in glycogen content preceded the blastic transformation of lymphocytes and the level dropped in transformed cells.—M.K.


Lymphocytes isolated from heart blood of Wistar strain rats were injected into (male Wistar × female August) F₁ recipients and the Simonsen reaction was examined. It was found that 10 and five million cells induced significant increase of spleen weight (referred to 100 Gm. of body weight) while one million lymphocytes gave no effect. The increase of spleen weight related to 100 Gm. of body weight
ABSTRACTS

is, according to the author, a more appropriate index of the Simonds reaction than the comparison between spleen and kidney weights because the latter was found to be distinctly lower in experimental rats than in intact controls. On the basis of the above and also of his previous results, the author concludes that the lymphocyte population in heart blood of Wistar rats contains significantly fewer immunocompetent cells taking part in the graft-versus-host reaction than a population of lymph node or spleen cells.—M.K.


The influence of incompatibility in erythrocyte antigens of the AF and HR systems on survival of allogeneic skin grafts was examined in rabbits. It was found that incompatibility of these antigens in donor and recipient did not shorten the mean survival of the grafts. On the contrary, a slight but statistically significant prolongation of graft survival was observed. This prolongation could be correlated with the post-transplantation production of hemagglutinins. Immunization of rabbits with incompatible erythrocytes before skin grafting did not change the mean survival of skin grafts. Enhancement and antigenic competition are discussed as mechanisms underlying the phenomenon observed.—M.K.


The influence of nitrogen mustard on the reaction to transplantation of allogeneic skin was examined in inbred and randomly bred animals. Marked differences in the immunosuppressive effect of nitrogen mustard were observed depending on the animal species. Prolongation of the survival of allogeneic skin grafts was observed in CBA and R-III inbred mice strains as well as in mice from the random stock. Much weaker were the effects of nitrogen mustard on skin graft survival in the rats. The reaction to a second skin graft was unaffected by nitrogen mustard in both species.—M.K.

MISCELLANEOUS


Hematological indication for splenectomy was given in 134 patients. There were 38 hemolytic anemias, 80 thrombocytopenias, 14 pancytopenias and two lymphomas. In 105 patients, antibodies against erythrocytes and/or leukocytes and/or thrombocytes could be demonstrated in vitro. In 17 patients, an immunological process was assumed to be present on clinical grounds, and 12 cases were of resistant aplastic anemia. In patients with known or suspected immune disorders, splenectomy was performed after a 3-month period of unsuccessful immunosuppressive therapy. In 105 of 124 cases with known or suspected immunological diseases, the result was good or adequate, and six of 12 patients with aplastic anemia were clinically improved after splenectomy. Operative mortality was nil. The authors conclude that the operative risk is smaller than the danger inherent in long-term immunotherapy and that splenectomy should be performed as early as possible in appropriate patients.—H.-J.H.