HYPOTHERMIA A 32-week-pregnant woman developed a hemorrhage from an intracranial aneurysm which necessitated urgent craniotomy. She was operated upon using hypothermia to 30 C. and because of hemorrhage from the aneurysm her blood pressure was deliberately lowered by use of an 0.2 per cent solution of trimetaphan. The lowest recorded pressure was 40/25. Twenty-nine hours after operation, the patient gave birth to a normal child despite the fact that there had been long-continued uterine hypertonicity and excessive fetal movements toward the end of the operation. The patient recovered completely except for a slight dysphasia. *(Wilson, F., and Sedzimir, C. B.: Hypothermia and Hypotension during Craniotomy in a Pregnant Woman, Lancet 2: 947 (Nov. 28) 1959.)*

HYPOTHERMIA Experiments revealed that in animals with body temperature decreased to 28° C., as well as in those subjected to sedation without refrigeration, no change in antibody production or in the synthesis of nonspecific serum proteins was observed. Marked retardation of synthesis of specific and nonspecific serum proteins occurred only as a result of refrigeration (28° C.) combined with sedation. Antibody synthesis changed correspondingly to the rate of the synthesis of nonspecific serum proteins. *(Ughitel, I. Ya., and Konikova, A. S.: Antibody Production Under Decreased Body Temperature, Zh. Mikrob. Epid. i Immunobiol. 10: 77, 1958.)*

ERYTHROCYTE METABOLISM A principal function of the immature erythrocyte is the biosynthesis of hemoglobin, while that of the mature cell is to maintain hemoglobin in a functional state. The synthesis of heme from its simple precursors, glycine and succinate, is presented briefly. The biosynthesis of globin occurs in the same erythroid cells, but is much less well understood. However, investigation into hemoglobinopathies has revealed that sickle cell hemoblobin differs from normal hemoglobin in that one peptide has a valine instead of a glutamic acid residue; and hemoglobin C has a lysine residue in place of the same glutamic acid residue on the same peptide. Once hemoglobin is formed, the erythrocyte must maintain it in the reduced state (iron in ferrous form) for only then is hemoglobin capable of binding oxygen reversibly. This requires a mechanism for the continuous reduction of methemoglobin (iron in ferric form). The enzyme systems involved are dependent upon the integrity of the erythrocyte, are associated with carbohydrate metabolism of the cell, and require the regeneration of reduced pyridine nucleotides. In a study testing the susceptibility of erythrocytes to hemolysis by immune serum, nonisotonic solutions, and primaquine, young adult cells were far more resistant to lysis than older cells. From these and other studies, it is clear that the erythrocyte undergoes a process of aging and that its destruction is the end result of such aging. *(London, I. M.: Metabolism of the Mammalian Erythrocyte, Bull. New York Acad. Med. 36: 79 (Feb.) 1960.)*

RED CELL LYSIS Incomplete antibodies which bind complement bring about removal of most or some of transfused red blood cells with a half time of two to six minutes, mostly by the liver. Incomplete antibodies which do not bind complement bring about removal of red blood cells predominately in the spleen. Removal occurs in splenic circulation if the titer is 64 or higher; lower titers are associated with slower rates of removal. Decreased survival of red blood cells below expected times occurs in about one transfusion in 20 even though no antibodies to these cells are present. This destruction is too slow, however, to cause untoward effects. *(Mollison, P. L.: Blood Group Antibodies and Red Cell Destruction, Brit. Med. J. 2: 1035 (Nov. 21) and 2: 1123 (Nov. 28) 1959.)*

ERYTHROPOIESIS The relationship between the kidney and erythropoiesis was investigated in dogs subjected to bilateral nephrectomy or ureteral ligation. Removal of both kidneys is followed by a rapid depletion of erythroblasts from the marrow. Iron measurements showed a low iron turnover and reduced Fe^{59} incorporation in red cells of nephrectomized dogs. Bilateral ureteral ligation, although it results in the same elevation of blood urea nitrogen and the same degree of starvation as in the nephrectomized group,

shows no abnormality in erythropoiesis. The erythroblast population of the marrow is maintained. Although the plasma iron turnover is reduced, it is significantly higher than in the nephrectomized group and Fe^{59} incorporation into red cells is of the same magnitude as in the controlled group. In one bilaterally nephrectomized dog maintenance of marrow erythroblasts was observed after injection of erythropoietic factor. These data indicate that the cessation of erythropoiesis after nephrectomy cannot be accounted for by urea intoxication and that the kidney is probably the source of an erythropoietic factor. (*Naets, J. P.: The Role of the Kidney in Erythropoiesis, J. Clin. Invest. 39: 102 (Jan.) 1960.*)

PULMONARY CIRCULATION The effect of alveolar and blood carbon dioxide tension changes on the pulmonary vascular dynamics was measured in 12 dogs using an isolated lung lobe which was mechanically ventilated and perfused. Corollary observations were made for alveolar and blood oxygen tension changes. Increase in alveolar and pulmonary venous carbon dioxide tension, whereby the P_{CO_2} gradient between pulmonary arterial and pulmonary venous blood was lowered, resulted in a local elevation of pulmonary vascular resistance, probably from pulmonary arteriolar constriction. No significant hemodynamic variation occurred with high or low carbon dioxide tensions in the pulmonary artery, vein or alveoli of the explored lung segment as long as the pulmonary arteriovenous gradient for P_{CO_2} was maintained. Decreases in alveolar and pulmonary venous oxygen tension, whereby the oxygen tension gradient between pulmonary arterial and venous blood was lowered, resulted in local elevation of pulmonary vascular resistance. Perfuson of the isolated lobe with hypoxic blood produced no change in local pulmonary vascular resistance. It is postulated that a local homeostatic mechanism exists, probably similar to the one described for oxygen, which can divert blood from poorly ventilated alveoli that retain carbon dioxide to adequately ventilated segments of the lung. (*Manfredi, F. and Sieker, H. O.: The Effect of Carbon Dioxide on the Pulmonary Circulation, J. Clin. Invest. 39: 295 (Feb.) 1960.*)

PULMONARY EMBOLUS Pulmonary embolism may result in three types of disturbance in gas-exchange. One is the development of arterial oxygen unsaturation. A second abnormality is the development of hyperventilation. Hyperventilation serves the purpose of assisting normal arterialization of pumonary capillary blood. The exact mechanisms subserving hyperventilation are not known. The third abnormality is the development of significant differences between the carbon dioxide tension of arterial blood and end-tidal air. This is produced by dilution of alveolar air by the newly formed dead space. (*Robin, E. D., and others: Alveolar Gas Exchange in Clinical Pulmonary Embolism, N. E. J. Med. 262: 283 (Feb. 11) 1960.*)

CENTRAL BLOOD VOLUME The effect on central blood volume of ten minutes of moderately heavy leg exercise in the supine position was studied in ten normal subjects. Central blood volume was calculated from arterial dye-dilution curves following superior venacaval or right atrial injection. There was an increase of 141 to 745 ml. in eight subjects with an average for the entire group of 284 ml. During the 20 minutes of recovery the central blood volume declined in all ten subjects by an average of 375 ml. with a range of 127 to 782 ml. The optimal cardiovascular response to exercise is characterized by an augmentation of central blood volume accompanying an elevation of cardiac output commensurate with the increased peripheral oxygen requirements. The augmentation of pulmonary diffusing capacity during exertion is accompanied by an elevation of the volume of blood within the capillary bed. This and other studies would tend to support the view that a redistribution of circulating blood volume occurs during muscular exercise. (*Braunwald, E., Kelly, E. R., and Bullock, F. A.: The Effects of Exercise on Central Blood Volume in Man, J. Clin. Invest. 39: 413 (Feb.)* 1960.)

BLOOD COAGULATION The phospholipids of human platelets have been identified and measured utilizing a chromatographic technique. Platelet phospholipids are very similar to the phospholipids of human red cells.