ABSTRACTS

WILLIAM H. CROSBY, Lt.Col., MC, U.S.A., *Editor*

BLOOD BANKING AND TRANSFUSION

BLOOD STORAGE—A Panel Held at the Eighth Annual Meeting of the American Association of Blood Banks Nov. 21, 1955 in Chicago, Ill. Participants: *C. A. Finch*, University of Washington School of Medicine; *Margaret Sloan*, National Research Council; *Ivan Brown*, Duke University School of Medicine; *J. B. Alsever*, Southwest Blood Banks; *J. H. Akeroyd*, Lt. Col. MSC, USAR, Walter Reed Army Medical Center; *S. T. Gibson*, M. D., American Red Cross. Moderator—*J. G. Gibson*, Harvard University, Boston, Mass. Bulletin American Association of Blood Banks, Part I—*9:* 81–85, 1956; Part II *9:* 117–121, 1956.

An excellent general discussion of many aspects related to the problem of red cell survival and preservation. The salient facets of the problem and the several methods of approach under investigation are summarized. The use of additives such as certain nucleosides, glycerolization and freezing as well as preservation with ACD solution is discussed by panel members. Results obtained to date as well as present limitations of glycerolization and freezing are concisely reviewed. The experiences of the military service during the Korean War are presented and the difficulties encountered in dealing with such perishable product and how they may be circumvented present a most interesting approach to stockpiling in case of national emergency. The experiences of the panel members constitute a stimulating presentation of the problem of blood storage and how the many aspects of the problem are being faced by investigators engaged in this most promising endeavor. —*W. A. C.*

PRESERVATION AND TRANSFUSION OF BLOOD. *D. M. Donohue, B. W. Gabrio and C. A. Finch.* From the Department of Medicine, University of Washington School of Medicine, Seattle, Washington. J.A.M.A. *161:* 784–788: 1956.

This is an excellent general review article on the present status of this subject, and is highly recommended for use in medical school teaching, and to anyone who wishes a general survey of the subject.—*T. R. T.*

ERYTHROCYTE PRESERVATION. VII. ACID-CITRATE-DEXTROSE-INOSINE (ACDI) AS A PRESERVATIVE FOR BLOOD DURING STORAGE AT 4° C. *B. W. Gabrio, D. M. Donohue, F. M. Huennekens, and C. A. Finch.* From the Departments of Medicine and Biochemistry, University of Washington School of Medicine, Seattle, Washington. J. Clin. Invest. *35:* 657–663: 1956.

Previous investigation from the authors' laboratory demonstrated a marked effect of the purine nucleosides on the metabolism of the red cell throughout storage. It was postu-

lated that the effects of adenosine were the result of splitting of inosine to yield hypoxanthine and ribose-1-phosphate, mediated by a nucleoside phosphorylase. The relative order of activity of purine nucleosides in the regeneration of phosphorylated esters of the stored erythrocyte was studied with human blood which had been stored 25 days. The compounds tested were adenosine, inosine, xanthosine, and guanosine. Detailed biochemical studies were undertaken and are described. Post-transfusion survival was studied in three units of blood which had been stored at 4° C for 42, 43, and 46 days. The posttransfusion survival was 87, 78, and 68 per cent respectively, determined by the radioactive chromium method.—*T. R. T.*

REVIVAL OF STORED BLOOD WITH GUANOSINE AND ITS SUCCESSFUL TRANSFUSION. *T. A. J. Prankerd.* From University College Hospital Medical School. London, England. Lancet *1:* 469–471, 1956.

Adenosine improves the post transfusion survival of stored blood, but is toxic when injected into man. Blood was stored in standard acid-citrate-dextrose preservative at 4°C for up to 8 weeks and revived before transfusion with either adenosine or guanosine. Either nucleoside improved cell survival and was associated with resynthesis of intracellular adenosine triphosphate. A pint of 6 weeks' old blood revived before transfusion by an hour's incubation with 750 mg. of guanosine was given to a uremic patient without adverse effect.—*R. H. G.*

PRESERVATION OF RED CELLS AT −79°C. *H. Chaplin Jr., H. Crawford, M. Cutbush and P. L. Mollison.* From the Medical Research Council's Blood Transfusion Research Unit, Postgraduate Medical School of London, W.12, England. Clin. Sc. *15:* 27–39, 1956.

Red cells were stored at −79 C in various glycerol-containing solutions for periods up to 21 months. When they were mixed with glycerol in a final concentration of 30 per cent and stored in amounts of the order of 200 ml., approximately 90 per cent of the original number of red cells were recovered for transfusion and found to have a posttransfusion survival of the order of 80 per cent. There was no evidence that posttransfusion survival diminished with the period of storage. The main requirements for making storage of red cells in glycerol at low temperatures practicable are cheap refrigerating equipment and the development of a simple and reliable red cell washing device.—*R. H. G.*

A PRACTICAL METHOD FOR THE ASEPTIC PREPARATION OF HUMAN PLATELET CONCENTRATES WITHOUT LOSS OF OTHER BLOOD ELEMENTS. *E. Klein, P. Arnold, R. T. Earl, and E. Wake.* From the Children's Cancer Research Foundation and the Tumor Therapy Group of the Division of Laboratories and Research Children's Medical Center, and the Department of Pathology, Harvard Medical School, Boston, Mass. N. England J. M. *254:* 1132–1133, 1956.

A closed system utilizing three plastic-bags is described. The equipment has been so designed as to permit, as desired, the preparation of platelet, red blood cell and leukocyte concentrates as well as cell-free-plasma or combinations of these within a closed system, thereby eliminating the risk of contamination forever prevalent in the open manipulation of these products. Suitable plastic bags (3), connecting tubing, and fittings as well as nonwettable metal surfaces are required to preserve platelet integrity. The equipment and technics are concisely described and illustrated.—*W. A. C.*

VIABILITY OF ERYTHROCYTES OF ACID CITRATE DEXTROSE BLOOD COLLECTED AND STORED IN AND INFUSED FROM AGED PLASTIC BAGS. *A. P. Remenchik, J. M. Dyniewicz, J. A. Schoenberger, and A. E. Osterberg.* From the University of Illinois—Department of Medicine, College of Medicine, Chicago, Illinois and Abbott Laboratories, Chicago, Illinois. J. Lab. & Clin. Med. *48:* 469–470, 1956.

A study of the effects of aging plastic bags containing ACD solution designed for the collection and storage of blood was carried out in connection with the viability of erythrocytes collected, stored in, and infused from these bags. ACD bag containers with a shelf

life of six and fifteen months old were used. Collection and reinfusion of blood from the bags was carried out on the same day in the case of six month old plastic bags. Immediate and 24 hour erythrocyte survivals were determined using radiochromate. Inorganic phosphorous content and red cell fragility in 0.6% NaCl were determined after 21 days storage at 5 C. After 21 days' storage the values for these determinations were within acceptable limits. Four trials were reported in the case of six month old plastic bags and two trials in the case of fifteen month old plastic bags. It was concluded that prolonged storage of plastic bags containing ACD solution does not affect the immediate post-infusion survival using Cr^{51} labeling, the inorganic phosphorous concentration in plasma and the osmotic fragility of the erythrocytes in 0.6% NaCl solution.—*W. A. C.*

EXCHANGE TRANSFUSION IN THE TREATMENT OF (METHYL SALICYLATE) OIL OF WINTERGREEN POISONING. *A. K. Done and L. T. Otterness.* From the Department of Pediatrics, University of Utah College of Medicine, Salt Lake City, Utah; Pediatrics *18:* 80–85, 1956.

The case of a two year old white male who had ingested approximately 20 ml. of methyl salicylate is presented. The patient showed laboratory and clinical findings consistent with acute salicylate toxicity. During the first two hours after admission there was an increase in the salicylate level in plasma to 86 mg./100 ml. and the patient developed an intense hyperpnea with respiratory rate of 80 per minute. The pH of the blood remained in a normal to mildly alkalotic range with a CO_2 combining power of plasma at 25 volume/100 ml. An exchange transfusion was begun approximately 5 hours after admission. A total of 1465 ml of blood was removed and 1345 ml replaced. The procedure was well-tolerated and the authors estimated that a total of 305 mg of salicylate were eliminated during the first two hours of exchange transfusion procedure. The estimated rate of salicylate elimination in this patient was 226 mg per hour (152 mg) through the exchange transfusion and the balance accountable by urinary excretion. The child recovered. The authors feel that the employment of exchange transfusion in this case was instrumental in effecting a rapid lowering of salicylate blood levels.

It is suggested that exchange transfusion may also be of value in the treatment of poisoning by other agents in infants and children.—*W. A. C.*

ACUTE POISONING WITH ISONIAZID TREATED BY EXCHANGE TRANSFUSION. *B. E. Katz and M. W. Carver.* Pediatrics *18:* 72–76, 1956.

A case of accidental acute isoniazid poisoning in a 19 month old child is reported. Symptoms of acute toxicity developed rapidly with tonic and clonic convulsive seizures and cessation of respiration. Initial treatment was by gastric lavage. Approximately three hours after the ingestion of the drug an exchange transfusion was begun. Total blood withdrawn was 1115 ml and 1100 ml were replaced within one hour and fifty minutes. At the completion of the exchange transfusion the patient was breathing spontaneously, was awake, and active. Isoniazid blood levels were carried out with the initial and specimen obtained at the time of the exchange transfusion showed 38.6 micrograms of the drug per ml. of blood. At the completion of exchange transfusion the isoniazid blood level was 26.4 μg. Except for moderate hepatomegaly which was apparent during early convalescence and accompanied by thymol turbidity of 3 units the hospital course was uneventful.—*W. A. C.*

CONTRAINDICATIONS FOR PLASMA AS THE FIRST FLUID IN SEVERE SHOCK AFTER BURNS. *A. G. Bettman,* Portland, Oregon. Am. J. Surg. *91:* 937–9, 1956.

The author feels that the early treatment designed to effect drying of the oozing surfaces followed by the administration of fluid is the treatment of choice of the burned patient with a marked deficit in circulating fluid.

The administration of plasma to the severely dehydrated patient in deep shock is considered deleterious since, due to the osmotic activity of plasma, it may serve further to decrease available intravascular fluid, and sludging of blood may take place. The author points out that this observation pertains only to the use of plasma as a primary fluid administered to the severely burned patient, and that the applicability of his observations is definitely related to the degree of dehydration present.—*W. A. C.*

STABILITY OF PROTEIN, ENZYME, AND NONPROTEIN CONSTITUENTS OF STORED FROZEN PLASMA. USE IN STANDARDIZATION AND CONTROL OF CHEMICAL PROCEDURES. *R. L. Walford, M. Sowa, and D. Daley.* From the Department of Pathology, University of California School of Medicine, Los Angeles, California, and the Laboratory Service, Chanute Air Force Base Hospital, Illinois. Am. J. Clin. Path. *26:* 376–80, 1956.

Stored frozen outdated plasma obtained from discarded bank blood may be used to advantage in the clinical laboratory. In some determinations frozen plasma may supply a partial substitute for pure standards which may be applied on a day-to-day basis as laboratory controls.—*W. A. C.*

A SURVEY OF SOME VOLUNTARY BLOOD DONORS IN NEW SOUTH WALES. *R. J. Walsh and K. Clemens.* From the New South Wales Red Cross Blood Transfusion Service—Sidney, Australia. M. J. Australia *2:* 205–209, 1956.

An investigation was conducted on certain social and psychological aspects of blood donors in New South Wales. New volunteer donors were questioned, records of donors that had enrolled several years previously were examined and all recent records for a consecutive two month period were reviewed.

Statistical analysis was carried out on such factors as reasons for giving blood (volunteers). It is interesting that in this category contact or association with other donors accounted for 44.5 per cent of new volunteer donor motivation. These findings were somewhat surprising since in the case of a bank trying to bolster a recipient responsibility replacement policy only 82 per cent of new volunteer donors gave as reason for their coming to the blood bank the fact that friends or relatives had received blood. The statistical analysis of reasons for new enrollments as blood donors was carried out during a time when public appeals through the press and radio were at a minimum and certainly were not urgent in nature. Donors enrolled in 1941 showed a preponderance of female donors with a change to a preponderance of male donors in 1948. An investigation was carried out to determine the distribution of donors according to the number of donations before a donor discontinued repeat donations. Figures for 1941 and 1949 remain practically constant and show that voluntary donations usually are made three times before there is a sharp drop in the number of re-visits to the blood bank. Percentage donations fall sharply from 14.3% for three times donors to 6.9% for four times donors. An effort was also made to ascertain information concerning occupational distribution among donors compared to the overall distribution of population according to the 1947 Census of the Sidney Metropolitan Area. It was found that all occupational groups were well-represented and that there had been a significant increase in the number of commercial and clerical employee groups, both male and female. Males provided approximately 70 per cent of the required donations in recent years. The authors point out that this is the first time that a study of this nature has been carried out, but they abstained from probing into the motivating factors in some persons and the inhibiting factors in others since this function would be more appropriately performed by a psychologist. The authors point out that fear, lethargy and selfishness play a deterring part in the most difficult problem of motivating the volunteer donor to approach the blood bank.—*W. A. C.*

RESULTS OF THE USE OF DRIED MIXED HUMAN BLOOD PLASMA OF CZECHOSLOVAK PRODUCTION. *E. Dobrý.* From the Research Institute of Hematology and Blood Transfusion, Praha. Čas. lék. čes. *95:* 326–329, 1956.

The author discusses the results of the use of dried mixed human blood plasma of Czechoslovak production. The percentage of pyrexial reactions for the year of production 1951 (2nd half) amounted to 4.5%. For the production year 1952, they amounted to 3.5% for the 1st half and to 2.8% for the second half. For 1953, they amounted to 1.2% for the first half and to 0.6% for the second half. For the first half of 1954, they were 0.8%. Attention is drawn to the fact certain disease conditions (cirrhosis of the liver, epidemic hepatitis, nephrosis and malignant disease) display a higher susceptibility to pyrexial reactions. The continuous and obvious fall in the percentage of pyrexial reactions, not only in general, but also in those diseases with increased reactivity, points to a systematic improve-

ment in the quality of work of Czechoslovak transfusion service. Allergic reactions wer reported from 0.2% to 0.5% in the individual production years.—*M. N.*

BLOOD BANKING IN A SMALL TOWN. *O. Van Der Velde*, Holland, Michigan. Bulletin American Association of Blood Banks *9:* 107–109, 1956.

The blood bank program for the small community of Holland, Michigan is presented (population 12,000 with service to an area of approximately 40,000 inhabitants). This program serves 110 hospital beds and handles about 1,500 units of blood per year. The program has been in operation since 1948.

The experiences of this community in establishing an efficient program based on 85 to 90 per cent replacement are summarized including the importance of guidance from local medical society, public education, donor recruitment and the role of civic organizations in a blood bank activity. A summary of costs and facilities for this community is given, stressing the fact that cost per unit must be kept within the reach of everyone. Average cost of blood in this program has been $6.81 unit.—*W. A. C.*

BILE PIGMENTS

FAMILIAL NON-HEMOLYTIC JAUNDICE WITH KERNICTERUS. A REPORT OF TWO CASES WITHOUT NEUROLOGICAL DAMAGE. *B. Childs and V. Najjar.* From the Department of Pediatrics, Johns Hopkins University Medical School, and Harriet Lane Home, Johns Hopkins Hospital Baltimore, Maryland. Pediatrics *18:* 369–377, 1956.

In 1952, Crigler and Najjar described seven children with familial nonhemolytic jaundice, all descendants of the same forebears. Six of the patients had progressive neurologic lesions, resembling kernicterus and terminating fatally. One patient, aged 18 months, at the time of the publication, did not exhibit evidence of neurologic damage. In the present report the authors give a follow-up on this patient, who is now five years old, and include the history and laboratory findings of an additional case, belonging to the same kinship. Both patients have been jaundiced since shortly after birth and exhibit serum bilirubin levels of 20 to 30 mg. per 100 ml., almost all of the indirect type. Evidence of hemolytic anemia or liver functional impairment is lacking. Neurological symptoms are absent. This is in contrast to the six cases previously reported, who all developed spasticity and choreoathetosis within the first few weeks or months of life. The reason for this difference in clinical symptomatology is not known. It does not seem to be related to the serum bilirubin level.—*R. S.*

CONGENITAL NON-HEMOLYTIC JAUNDICE WITH DISEASE OF THE CENTRAL NERVOUS SYSTEM. *I. M. Rosenthal, H. J. Zimmerman, and N. Hardy.* From the Departments of Pediatrics and Medicine, University of Illinois College of Medicine, Chicago, Illinois. Pediatrics *18:* 378–386, 1956.

A 5 year old boy with severe congenital nonhemolytic jaundice and progressive neurologic symptoms is described. Extensive studies demonstrated normal liver function tests, patent biliary tract, and absence of hemolytic anemia. Bilirubin was crystallized from the serum. Other family members did not exhibit elevated serum bilirubin levels, but the first child of a marriage between the father's sister and the mother's brother died at the age of 4 weeks from a disease characterized by jaundice and central nervous system disease. This patient undoubtedly presents another instance of the syndrome described earlier by Crigler and Najjar.—*R. S.*

KERNICTERUS: FURTHER OBSERVATIONS ON THE TOXICITY OF HEME PIGMENTS. *R. Day.* From the Department of Pediatrics, State University of New York College of Medicine, New York, New York. Pediatrics *17:* 925–928, 1956.

Bilirubin appears to play an important role in the production of Kernicterus. In attempts to demonstrate toxic effects of bilirubin and other heme and bile pigments on a variety of living cells in vitro, these pigments were incubated with minced rat brain, rat diaphragm, Baker's yeast, and tetrahymena pyriformis. In general, decreased oxygen up-

take or decreased motility were observed with all the pigments tested. Addition of cytochrome C appeared to cancel the toxic effects of bilirubin and hematin. Survival of newborn rats following intra-peritoneal injection with bilirubin or hematin was impaired, but administration of cytochrome C did not exert a protective effect. Unfortunately, the author fails to give important details of the experiments such as the pH of the incubation mixtures before and after the incubations, and the range of the values obtained for inhibition in oxygen uptake in each series of experiments. These omissions render a critical evaluation of the data difficult.—*R. S.*

NOTICE

Through the kindness of the Editor, I have been permitted to communicate a problem which has arisen in the course of work in my laboratory on the biosynthesis and metabolism of cerebrosides. We have made sufficient progress to warrant an investigation of the metabolism of gluco-cerebrosides which accumulate in certain tissues of patients afflicted with Gaucher's disease. The cerebrosides which can be obtained from mammalian brain and spinal cord are predominantly galacto-cerebrosides. Spleens obtained from patients with Gaucher's disease appear to be the most promising source of the requisite gluco-cerebrosides. It would be most helpful if any readers who are aware of an impending splenectomy for a patient with Gaucher's disease could inform us of this condition with the hope that arrangements might be made to obtain samples of this tissue.—*Roscoe O. Brady, M.D. (Laboratory of Neurochemistry, National Institute of Neurological Diseases and Blindness, Bethesda 14, Md.)*

ERRATUM

BLOOD *12:* 91 (January), 1957. Dr. H. Lehmann writes that his statement (line 22 from the bottom) that hemoglobin J had been found in Algiers was incorrect. The hemoglobin J sample shown by Dr. Cabannes was a control sent him by Dr. Huisman, and so far hemoglobin J has not yet been found in North Africa, although it has of course been seen in West Africa (Liberia I).