Susceptibility to viral infection is not only influenced by age but by sex as well. In the human, these inter-related factors are difficult to evaluate. We have developed a test system in adult mice, however, which does allow ease of observation and control over 1 or the other of these 2 variables. A significant difference in death rate has been found between mature, male and female animals infected with a virulent strain of Coxsackie B1 virus. This difference in susceptibility could be related to hormonal effects. To test this hypothesis, mice gonadectomized at birth were infected as mature animals with the test virus. Results are summarized below.

	Unoperated		Sham-Castrated		Castrated	
	No.	Death rate (%)	No.	%	No.	%
Male	42	41	28	61	26	4
Female	37	11	32	6	33	9

Neonatal gonadectomy and the consequent hormonal changes did not exert an apparent effect on the response of the female to the infecting virus, whereas the adverse effect of maleness was negated by this procedure. The premise relating differences in susceptibility to hormone effects, therefore, is partially true. The increased susceptibility of the male is a sex-related characteristic.

- 108 *The Use of the Nitroblue Tetrazolium Reduction (NBT) Test in Diagnosis and Treatment of Bacterial Endocarditis.* B.H. PARK, M.A. SOUTH, F.F. BARRETT, J.R. MONTGOMERY, L. HEIM and R. A. GOOD, Ped. Res. Labs., Variety Club Heart Hosp., Univ. of Minnesota, Minneapolis and Dept. of Ped., Baylor Univ., Houston, Texas.

Despite the recent advances in the diagnostic and therapeutic armamentarium, the bacterial endocarditis remains one of the most challenging clinical problems. The conventional diagnostic methods for bacterial endocarditis often either fail or delay in the diagnosis and treatment of this disease. A new diagnostic test for the bacterial endocarditis is urgently needed in order to initiate the antibiotic therapy promptly. We have found the NBT test [PARK *et al.*, *Lancet* ii: 532, 1968] to be a useful diagnostic aid in these clinical situations. Patients with proven bacterial endocarditis and those with presenting symptoms suggestive of bacterial endocarditis were studied with the NBT test. The results were compared with those of controls. The absolute number and percentage of the NBT positive neutrophils were found to be regularly increased in seventeen patients with bacterial endocarditis (means: $3,150/\text{mm}^3$, 24.5%) as compared with normal control and patients with non-bacterial disease ($439 \pm 187/\text{mm}^3$, $6.86 \pm 2.87\%$). Furthermore, the clinical response to the antibiotics therapy was well correlated with the results of the NBT test. The simplicity and instant results are other advantages of NBT test as a diagnostic aid in bacterial endocarditis.

- 109 *Clinical and Laboratory Studies on Marmosets Experimentally Inoculated with Human Serum from Hepatitis Patients.* C. LIU, C.T. CHO, D.W. VOTH, D.J. SVOBODA and S. HEMPLER, Univ. of Kansas Sch. of Med., Kansas City.

It has been reported that hepatic changes and abnormal liver function tests occurred in marmosets injected with human serum from acute infectious hepa-

titis patients [DEINHARDT, F. *et al.*, *J. exp. Med.* 125: 673, 1967]. Using the Barker agent supplied to us by Drs. DEINHARDT and HOLMES, we have confirmed and extended their experimental findings. Inoculated marmosets showed SGOT and SGPT elevations and hepatic parenchymal cell changes after an average incubation period of 20 days. Duration of acute hepatitis lasted for about 6-8 weeks. Although infected marmosets usually did not appear clinically ill, 5 out of 47 animals died during the acute stage of illness.

Relative neutropenia with lymphocytosis was seen in differential counts of peripheral blood in marmosets with acute hepatitis. Corticosteroids given during acute hepatitis did not appear to alter the clinical course favorably or detrimentally. However, feeding of alcoholic beverages to marmosets with acute hepatitis or during early convalescence resulted in exacerbation of hepatic enzyme elevations and deaths.

Recently we have recovered a similar agent (Lyddon) by inoculating marmosets with the acute serum collected from one of our hepatitis patients. The incubation period for initial passage was 2 months. On subsequent passages, the incubation periods were shortened to 19-21 days. There was suggestive evidence from rechallenge studies that antigenic differences might exist between the Barker and Lyddon agents. (Supported by NIH Grant HD 02567.)

- 110 *Microbiological Studies in a Primitive Society: Significance of Escherichia coli from Yanomamö Indians.* WARREN C. EVELAND, Dept. of Epid., Sch. of Pub. Health; WILLIAM J. OLIVER, Dept. of Ped.; and JAMES V. NEEL, Dept. of Human Genetics, Univ. of Michigan, Ann Arbor, Mich.

The Yanomamö Indians of the northern Amazon tributaries constitute one of the largest unacculturated tribes of South America. The first sustained contact of Caucasians with a village of this tribe was in 1950; many villages still have had no or minimal contact with civilization. Stool samples obtained in 1967 during a field expedition to two recently contacted villages 250 miles apart were studied for serotypes of *E. coli*. Using standardized techniques described by the NCDC, six colonies were isolated from each of 72 samples and typed against 148 presently known serotypes of *E. coli*. Only 204/432 isolates were typable. Eight strains of enteropathogenic *E. coli* were isolated from 13 subjects; serotypes 055, 0111, and 0126 occurred in samples from both villages while five other enteropathogenic serotypes were confined to one of the two villages. Thus far ten new serotypically unique strains of *E. coli* have been isolated. For 8/10 of the new serotypes, positive reactions were confined to one village only; for 2/10, positive reactions were recognized in samples from both villages. *E. coli* of stool samples from an urban population of S. America (Cali, Columbia) gave negative reactions to the new serotypes. Although these observations substantiate the ubiquity of certain *E. coli* serotypes, a more pertinent observation is the finding of at least ten new serotypes, and the relative uniqueness of these between villages and apparent absence from a control population. These investigations are one aspect of an effort to understand primitive man in his ecosystem; they suggest that the 'internal milieu' must be as well studied as the 'external'.

- 111 *Antistaphylococcal Substance(s) from a Pharyngeal Organism.* KATHERINE SPRUNT, GRACE LEIDY, WINIFRED REDMAN, Columbia Univ., NYC.

In our study of the ecology and significance of the normal bacterial flora of the human pharynx we have noted in the cultures of 4 individuals an organism which elaborates a substance(s) producing wide clear zones in agar overlays containing staphylococci. Growth of the organism, a slow growing coccus (or coccobacillus), is inhibited *in vitro* by some ingredients of normal flora. The organism, which is sensitive to commonly used antibiotics such as penicillin, coexists in the pharynx with its inhibitors and with staphylococci and may play a role in maintaining the normal interrelationships between species. The antistaphylococcal substance(s) produced by it is filterable, heat stable and has a limited antibacterial spectrum. All staphylococci tested, including those resistant to methicillin, are highly sensitive (1/400 to 1/800 dilution of an autoclaved broth supernatant incorporated in blood agar). Using the same preparation, enterococci are moderately sensitive (1/50 dil) and all other species examined are either weakly sensitive (1/10–1/25 dil) (Group B and C β -hemolytic streptococci, *N. catarrhalis* and some viridans streptococci) or resistant (Group A, β -streptococci, some viridans streptococci, other *Neisseria* and all gram-negative bacilli tested including *H. influenzae*). The antibacterial agent is bactericidal for staphylococci; persisters remain sensitive. No resistant mutants have been selected. The antibacterial capacity for the staphylococcus is not destroyed by exposure to trypsin, chymotrypsin or peptidase, or a range of pH from 9.4 to 4.3. This organism may play a significant ecological role in the pharynx; its antistaphylococcal substance is potentially useful.

- 112 *Local Infection and Bacteremia from Scalp Vein Needles and Polyethylene Catheters.* GEORGES PETER, FREDERICK H. LOVEJOY, Jr. and JOHN D. LLOYD-STILL, The Children's Hosp. Med. Center, Boston, Mass. (introduced by David H. Smith).

The risk of infectious complications is generally assumed to be less frequent with intravenous infusions given via scalp vein needles (SVN) than those administered by polyethylene catheters (PCT). To assess this assumption, the incidence of bacteremia and local infection (positive needle/catheter tip culture) from SVN and PCT was prospectively studied on 2 general medical wards. Bacteremia occurred only with PCT (2/25, 8%). The overall incidence of local infection with SVN (12/142, 8.5%) was significantly less ($p = 0.06$) than that with PCT (6/25, 24%). Although the incidence of SVN local infection increased with the duration of use, up to 120 h it was clearly lower than that with PCT in this study and previous reports. After 120 h of use, the incidence of local infection was similar in both groups (SVN, 3/11 vs. PCT, 4/14). However, pathogenic bacteria were recovered significantly less frequently and non-pathogenic bacteria ('skin contaminants') more frequently from the SVN tips than those with PCT ($p < 0.001$). This difference may explain the greater safety of SVN in comparison to PCT. This safety is borne out by the 2 cases of PCT-associated bacteremia during a 3-month study and 2 cases in the preceding 6 months in contrast to no cases associated with SVN. This study re-emphasizes the inherent risk of venous catheterization and documents that SVN are a relatively safe alternative.

- 113 *Fluorocarbon Emulsions as a Blood Substitute.* LE-
LAND C. CLARK, Jr., SAMUEL KAPLAN and FER-

NANDO BECATTINI, Dept. of Ped., Coll. of Med., Univ. of Cincinnati, Cincinnati, Ohio.

In 1966 CLARK discovered that animals breathing certain perfluorinated liquids can transfer enough oxygen and carbon dioxide to sustain life [Science 152: 1755, 1966]. This suggested that these liquids may serve as valuable intravascular gas transport agents. Inert organic compounds having a high oxygen and carbon dioxide solubility were emulsified by intense sonication in the presence of surfactants to produce opalescent liquids having metabolic gas transport capabilities resembling whole blood. During intravenous infusion and ventilation with O_2 the mixed venous pO_2 rose to between 150 and 300 mm Hg while the arterial pCO_2 and pH were normal. A fourfold increase in brain oxygen cathode current was demonstrable. The increase in mixed venous pO_2 was initially related to the fluorocarbon content of the circulating blood. Since dogs survived in apparent good health these preparations may ultimately be used as a blood substitute or for organ preservation. (Supported in part by NIH HE-12419.)

- 114 *Effect of Heparin on Mortality Rate in Septicemia with Associated Diffuse Intravascular Coagulation.* JAMES J. CORRIGAN, Jr. and CHARLES M. JORDAN, Dept. of Ped., Emory Univ. Sch. of Med., Atlanta, Ga.

That diffuse intravascular coagulation (DIC) occurs in septicemia has been well documented and reported to occur almost exclusively in patients with hypotension. Heparin has been shown to effectively correct this coagulation defect but the efficacy of this agent in changing the high mortality rate in this group of patients has not been reported. The purposes of this investigation were to determine the frequency of DIC and to evaluate the effect of anticoagulation on the mortality rate in this group. Twenty-six children with septicemia and systolic blood pressures below 80 mm Hg had detailed coagulation studies performed and 24 were anticoagulated with heparin. Therapy also consisted of antibiotics, plasma expanders, IV fluids, transfusions and Isuprel. Two patients were given corticosteroids. No complications secondary to heparin occurred. The studies showed that all patients had abnormally long partial thromboplastin and prothrombin times, and all but one had thrombocytopenia. Classical DIC (thrombocytopenia with reduced factors II, V, VIII and fibrinogen, positive fibrin split products and normal euglobulin lysis time) was clearly present in 40% and highly probable in 96% of the cases. The overall mortality rate was 62%. Although 72% of the fatal cases had severe hypofibrinogenemia as compared to 25% who eventually survived, no correlation could be shown between the severity of the DIC and the mortality rate. These data again suggest that most, if not all, patients with sepsis and low blood pressure have DIC. Even though anticoagulation could correct the coagulation defect in most of the cases, heparin did not appear to significantly affect the mortality rate.

- 115 *Functional Studies of Young Versus Old Platelets in a Patient with Chronic Thrombocytopenia.* CHRISTINE A. JOHNSON, CHARLES F. ABILDGAARD and IRVING SCHULMAN, Univ. of Illinois Coll. of Med., Dept. of Ped., Chicago, Ill. and Univ. of California Davis Sch. of Med., Dept. of Ped., Davis, Calif.

The reproducible platelet production cycle following infusion of fresh frozen plasma (FFP) in a girl with