In albino Swiss mice, h.s. No. 1 was the most virulent strain producing typical neurotropic effects with exceptionally small quantities of virus. When levels of the other strains resulted in neither neurotropic signs nor death after intramuscular inoculation of mice, 100 fold less of h.s. No. 1 produced 96 % mortality.

In young plasma clot cultures of human fetal brain, h.s. No. 1 was again the most virulent strain. Compared to simultaneous quantitation of strains in RK cultures, 10 to 300 fold less h.s. No. 1 virus was required to infect brain cultures. One of the other strains showed a lesser increase in virulence for human brain relative to the other 3. No difference in virulence of any of the strains was noted in cell cultures of human amnion, diploid lung or green monkey kidney.

These data suggest that inherent differences in the neurotropic capacities of herpes simplex viruses may be a determinant in the production of central nervous disease after infections of man. (SPR)

- 38 *Attenuated Vaccinia in the Elective Primary Vaccination of Eczema Patients.* C. HENRY KEMPE, University of Colorado School of Medicine, Denver, Col.

1009 patients suffering from eczema or other skin disorders have received elective primary vaccination with the CVI-78 strain of vaccinia. The vaccine is attenuated by repeated passage through chick embryos; its infectivity titer is 8.4 (TCID₅₀/ml), and it is free of bacteria. It was administered by one of three routes (multiple pressure, subcutaneously or jet gun) with a minimal dose of TCID₅₀ of 1000 and a maximal dose of TCID₅₀ of 30,000. Local and systemic reactions and temperature elevations in these children were significantly less marked than those experienced with a standard strain of vaccinia in normal children. No virus dissemination or other complications occurred, except for two instances of mild erythema multiforme. Seroconversion was noted in all 387 patients tested to date. Multiple pressure revaccination with a standard strain one to six months later resulted in marked modification in the reaction to the standard strain; no systemic reactions developed. It would appear that CVI strain of vaccinia virus is effective for elective primary vaccination of children suffering from eczema for prevention of eczema vaccinatum. (APS)

- 39 *Severe Illness (Atypical Exanthem) Following Exposure to Natural Measles. 11 Cases in Children Previously Inoculated with Killed Vaccine.* PHILIP R. NADER*, MARSHALL HORWITZ* and JOHN ROUSSEAU*, National Communicable Disease Center USPHS, Atlanta, Ga., and Community Hospital, Riverton, Wyoming (introduced by Richard W. Blumberg).

A cluster of cases of an unusual exanthem with high fever, myalgia, tachypnea and prostration occurred in children in Riverton, Wyoming, in the spring of 1966. The initial macular rash characteristically began on the lower extremities and progressed cephalad. Most cases also developed vesicular lesions which were larger and less discrete than those seen in varicella and did not crust. A purpuric rash was noted in one instance. One child developed pneumonia and another had generalized edema. Epidemiologic investigation revealed that all 11 cases occurred among a group of 97 children who had received three injections of inactivated measles vaccine in 1962. All had a recent exposure to natural measles, their first known exposure since receiving the

inactivated vaccine four years previously. Of 31 children in this group who subsequently received live vaccine, two developed local reactions at the site of injection of live vaccine. Viral isolation attempts in four of the cases were negative. Serial serologic specimens from five atypical cases showed a greater than fourfold rise in CF and HAI measles antibodies in one case and a greater than fourfold fall in four cases. Initial samples in these four cases were obtained one to three weeks after onset of rash. CF antibodies to varicella and herpes simplex remained stable at low or undetectable levels. (APS)

- 40 *Maternal and Neonatal Infection with Cytomegalovirus in Taiwan.* E. RUSSELL ALEXANDER, Univ. of Wash. Sch. of Med., Seattle, Wash., and U.S. Naval Medical Research Unit No. 2.

The prevalence of cytomegalovirus (CMV) infection in normal pregnant women in Taipei was measured by culturing cervical specimens in human diploid fibroblast cells. Eighteen of 100 Chinese women but none of 33 Americans yielded cervical CMV once (15 cases) or more (3 cases) during the second and third trimesters. Multiple urine specimens were examined from 58 of the Chinese and 36 Americans. CMV was recovered from one Chinese and one American, but not from their cervixes. CMV was not recovered from the urine of 15 cervical positive women (59 cultures), the saliva of 11 (33 cultures), nor the placentae of 8. Five of 13 cervical positive women yielded CMV on post partum examination. Fourteen infants of cervical positive Chinese mothers and 11 infants of the next cervical negative mother to deliver were studied. None of the 25 yielded CMV in urine or saliva in the first week of life. Fourteen of these 25 infants first became positive between 6 weeks and 6 months of age and most remained positive on repeated cultures. Eight were born to previously positive mothers and 6 to previously negative mothers, indicating no direct association with the CMV status of the mother. Likewise, abortion or prematurity was not increased in infected mothers. Infected infants did not differ from uninfected in body measurements, growth, or apparent illness. Thus, the high prevalence of inapparent cervical CMV infection in the Chinese sample did not result in a high risk of fetal infection or infant disease, possibly because recovery of cervical CMV alone indicates a localized recurrence rather than generalized infection. (SPR)

- 41 *Investigation of 26 Childhood Cases of Acute Epidemic Poststreptococcal Glomerulonephritis.* ALFRED J. FISH*, ROGER C. HERDMAN* and ROBERT A. GOOD, Ped. Research Labs. of Variety Club Heart Hosp., Univ. of Minn., Minneapolis, Minn.

Controversy concerns immunological and ultrastructural features of acute poststreptococcal glomerulonephritis. Opportunity to study, by renal biopsy, immunohistochemistry and electron microscopy, an entire single population of patients with poststreptococcal glomerulonephritis permitted us to resolve several conflicts and to learn more of pathogenesis and natural history. An epidemic of 26 cases of acute poststreptococcal glomerulonephritis occurred among Red Lake Reservation Indian children 2 to 15 years of age. Type 49 beta hemolytic streptococci reappeared at Red Lake for the first time since the 1953 epidemic of acute glomerulonephritis. Clinical manifestations were minimal but most children had pustular streptococcal skin le-

sions. Endothelial proliferation and leukocytic infiltration was observed in percutaneous renal biopsies. As regularly observed in our previous studies of sporadic acute glomerulonephritis, approximately $\frac{1}{4}$ of these patients had nodular deposits of IgG and beta $_2$ C globulin along the glomerular basement membranes by immunohistochemical analysis. 90 % of remaining patients showed interrupted linear deposition of beta $_2$ C along glomerular membranes without IgG. Electron microscopic study revealed minimal development of the characteristic discrete electron dense deposits on the epithelial side of the glomerular basement membrane. Focal membrane thickening and basement membrane-like material among mesangial cells was observed. This study, sampling an entire spectrum of acute poststreptococcal glomerulonephritis, suggests that nephritogenic strains of streptococci may exert a toxic action rendering the glomerulus susceptible to injury by antigen-antibody complexes. (Supported by American Heart Association, USPHS, and Minn. Heart) (SPR)

- 42 *Focal Nephritis, a Form of Normocomplementemic Persistent Glomerulonephritis Responsive to Steroid.* C.D. WEST, A.J. McADAMS* and J.D. NORTHWAY*, Children's Hospital, University of Cincinnati, Cincinnati, Ohio

Since advent of renal biopsy, the definition of a type of persistent nephritis characterized by focal and segmental lesions has been possible. Heptinstall has recognized this lesion in adults in the absence of lupus, bacterial endocarditis, anaphylactoid purpura or periarteritis. We have observed 11 cases of focal nephritis in children not attributable to any of the above entities. All the patients have been normocomplementemic and have had a course characterized by a mild-to-severe nephrotic syndrome, usually with signs of nephritis. The data suggest that signs and symptoms develop rapidly after onset, without a long, silent, subclinical stage. In 9 of the cases, onset was preceded by an upper respiratory infection, but ASO titers were usually not elevated. The entity is important to recognize because of the beneficial effects of steroid therapy. In 3 of our patients not treated with steroid initially, the nephritic-nephrotic picture subsided, but all signs and symptoms recurred several months later, usually following a respiratory infection. After treatment in these 3 patients as well as in 7 of 8 treated shortly after onset, no recurrences have been noted in follow-ups ranging from 9 months to 4 years. The 11th patient never responded to therapy and eventually succumbed with a severe nephrotic syndrome. In the remaining 10 patients, signs of the nephrotic syndrome have slowly disappeared with therapy, and several show no evidence of renal disease except for focal glomerular scarring. The similar pathological picture, clinical course and therapeutic results in the 10 responsive patients suggest that focal nephritis in children is a disease entity. Its diagnosis rests on typical histopathological changes by renal biopsy in a normocomplementemic patient. (APS)

- 43 *Evaluation of Combined Therapy (Steroids and Cyclophosphamide) in the Steroid Resistant (SR) and Steroid Dependent (SD) Nephrotic Syndrome.* LUTHER B. TRAVIS* and WARREN F. DODGE, University of Texas Medical Branch, Galveston, Tex.

Over the past 5 years there has been a revival of interest in the combined use of steroids and immunosuppressive agents in the child with the idiopathic

nephrotic syndrome (INS) who is either SR or SD. The combined administration of steroids and cyclophosphamide is usually effective in inducing an initial response in the majority. Little information is available on the course of these patients after cyclophosphamide is discontinued.

Of 169 patients with INS, approximately 40 % were found to be either SR or SD. Thirty-five of these were evaluated and subjected to combined therapy. Eleven were SR and 24 were SD. Seventeen of the 35 are classified as having 'lipid' nephrosis, while 10 had proliferative and 8, membranous glomerulonephritis. Eighteen SD patients had a complete initial response while 6 SR patients exhibited a similar response. An additional 3 SR patients had a partial response. Approximately 50 % of the patients who initially had a complete response and who have been followed for at least 6 months after discontinuing cyclophosphamide, have, however, had further exacerbations and their ultimate course does not appear to have been materially altered.

This study would suggest that 1. SR and SD are not infrequent; 2. clinical and pathologic studies may define groups of patients who are either steroid sensitive, SR or SD, but may be of little help with individual patients; 3. combined therapy will usually induce an initial complete response; 4. approximately one-half of patients so treated will ultimately revert to some degree of unresponsiveness. (SPR)

- 44 *Experimental Studies on Pathogenesis of Nephrotic Hyperlipemia and Dysproteinemia.* WALTER HEYMANN, STEPHEN CHENTOW* and JOHN L. ZITEL*, Western Reserve University, Department of Pediatrics, Cleveland, Ohio.

Drainage of the abdominal chyle duct was carried out for 1-18 days in 11 rats, a continuous i.v. drip preventing dehydration. Marked hypoalbuminemia (with values < 1.0 gm %) developed in all and cholesterol and total lipid values in sera remained within normal limits. At the same time electrophoretic patterns obtained on sera of these rats showed the appearance of proteins with the mobility of α_2 globulins that were not obtained before. Marked decreases of γ globulins were also noted. In as much as these observations were made on animals without kidney disease, it would seem possible that the increase of α_2 globulins observed regularly in the nephrotic syndrome do not reflect any etiological or pathogenic manifestation of the disease process. These observations also do not support the contention that the nephrotic hyperlipemia is due to hypoalbuminemia. Sera of 5 children with non-nephrotic hypoalbuminemias also revealed normal cholesterol and total lipid values with increased α_2 globulins. (APS)

- 45 *Accelerated Intravascular Coagulation in the Hemolytic Uremic Syndrome.* CAROLYN F. PIEL*, KENNETH HADLEY* and RODERIC H. PHIBBS*, Univ. California-S.F. Medical Center, San Francisco, Cal. (introduced by M.M. Grumbach).

Renal tissue was obtained by percutaneous biopsy in 11 patients with hemolytic uremic syndrome from 9 to 365 days after onset of disease; by autopsy in 5 after 6 to 58 days of illness. By light microscopy, the early histologic lesion (up to 30 days) was characterized by glomerular capillary ectasia and intracapillary eosinophilic depositions (fibrin-like material). Regardless of duration or severity, electron microscopy revealed irregular swelling and fragmentation of basement mem-