the first case and to date, after 3 months, this is the only region showing similar changes in studies of the second patient. An agent, immunologically identified as measles virus has been isolated from one of these specimens. This study underscores the importance of post mortem cultivation of neural tissue in all patients with chronic CNS disease.

Effect of elevated blood tyrosine on intellectual development of premature infants. JOHN H. MENKES, DORIS W. WELCHER, HELENE LEVI, EVELYN R. STERN, JOSEPH DALLAS and NEIL E. GRETSKY. *UCLA Sch. of Med., Los Angeles, Calif.; Johns Hopkins Sch. of Med., Baltimore, Md.*

Blood tyrosines were followed from birth to nursery discharge in 71 premature infants fed a high-protein formula supplemented by 60 mg/day of ascorbic acid. In 89% tyrosine concentrations were abnormal, and in 38% the maximum observed was 5.0 mg% or higher. Maximum blood tyrosine correlated with gestational age ($p < 0.05$) but not with birth weight.

On a follow-up study performed at 15 months, infants with high tyrosine levels had no increase in neurological abnormalities. Between 7 and 8 years a second follow-up was done on 64 children. This included a WISC and tests for psychomotor function. Two children had died in the interval and six others were too retarded for full testing. The full scale IQ of all children correlated with birth weight ($p < 0.01$). The mean IQ of high and low tyrosine subjects was 85.9 and 86.2, respectively. When infants were grouped by birth weight a significant difference was detected in subjects weighing 2000+ gm.

| | Full IQ | Verbal | Performance |
|---|---|---|---|
| High tyrosine (5) | 85.4 ± 5.5 | 90.4 ± 6.1 | 82.4 ± 6.2 |
| Low tyrosine (11) | 95.0 ± 14.0 | 93.4 ± 13.2 | 97.8 ± 14.2 |
| p = | <0.1 | n.s. | <0.02 |

Significant differences were recorded in scores on object assembly ($p < 0.05$), picture assembly ($p < 0.05$), and picture completion ($p < 0.10$). We observed no effect of high tyrosine levels on intellectual performance of smaller infants, who, on the whole, are a greater risk for other complications of prematurity.

Coagulation abnormalities in patients with hydrocephalus and ventricular-jugular (V.J.) shunts. MARIE STUART, JAMES STOCKMAN, SCOTT MURPHY, JOAN URMSON, MARY AMES, and FRANK OSKI. *Univ. of Pennsylvania Sch. Med., and Children's Hosp. of Philadelphia, Pa.*

The presence of silastic prostheses and tubing in the circulation is now recognized to produce alterations in hemostasis. Stimulated by the observation of severe disseminated intravascular coagulation in a child with a clotted V.J. shunt and the recognition that obstruction to such catheters is one of the undesirable complications of its use in children with hydrocephalus, coagulation studies were performed in 25 asymptomatic children with V.J. shunts. Prothrombin and partial thromboplastin times, Factor V and VIII levels and platelet counts were normal in all. In 2 of the patients the thrombin time was prolonged and in 1 of these patients significant increases in the level of fibrin split products were demonstrable. In 4 patients platelet survivals, using $Cr^{51}$ labeled platelets, were performed. In 2 the survival was significantly reduced. Patients in whom coagulation abnormalities or shortened platelet survival were present developed obstructive complications in their shunts. It would appear that catheter problems can be anticipated by performance of coagulation studies. The use of aspirin and dipyridamole, agents which inhibit platelet aggregation in vivo, may provide a means of eliminating the complication of shunt obstruction.

Prognosis in childhood epilepsy: A follow-up study of 148 cases in which therapy had been suspended after prolonged anticonvulsant control. JEAN HOLOWACH, DON L. THURSTON, and JAMES L. O'LEARY (Intr. by Philip R. Dodge). *Wash. Univ. Sch. of Med., St. Louis, Mo.*

One hundred and forty-eight unselected epileptic children, seizure-free for 4 years on anticonvulsant medication, were followed for 5 to 12 years after drug withdrawal to determine the frequency of seizure recurrence and to discern any prognostic criteria. Thirty-six children (24%) had a recurrence of seizures. Sixty-one per cent of recurrences took place during the first year of gradual discontinuation of therapy. Drug withdrawal at puberty (9–15 yrs) was not associated with increased risk. An analysis of the records revealed no relation of relapse to sex, race, heredity, or seizure frequency. The prognosis was very good in children who had an early age of onset with prompt control (relapse rate 13%). There was at least a two-fold increase in relapse in cases with a late onset, with prolonged duration of seizures, and evidence of neurologic, psychologic, and electroencephalographic abnormalities. The most striking correlate to relapse was seizure type.

Best results were obtained in children with grand mal (relapse rate 8%), febrile seizures (12%), and uncomplicated petit mal (12%). In psychomotor attacks the relapse rate was 25%. The highest recurrence was in children with Jacksonian seizures (53%) and those who had seizures of more than one type (40%). It was concluded that these data suggest unquestionable criteria for drug withdrawal in epileptic children after prolonged seizure control with a favorable outcome in a large percentage of selected cases.

## CHILD DEVELOPMENT I: BEHAVIORAL SCIENCE AND EPIDMIOLOGY

Perinatal mortality, economic and racial influences on the sex ratio. RICHARD L. NAEYE, LESLIE S. BURT, DAVID L. WRIGHT, and WILLIAM A. BLANC. *Pennsylvania State Univ. Coll. of Med. and Columbia Univ. Coll. of Physicians & Surgeons, Hershey, Pa., and New York, N.Y.*

An excess of fetal and neonatal deaths in male offspring is found in man, domestic animals and some insects. In humans, the male disadvantage is reportedly less when perinatal infant mortality is high, i.e. in nonwhites and the socioeconomically disadvantaged. The present study offers some explanations. In an analysis of 2735 consecutive newborn autopsies, the ratio of males to females was 1.28:1 which differs significantly from the 1.05:1 ratio for all U.S. live-births. Within this series the ratio for stillbirths was 0.95:1 and for live-births 1.45:1. Most disorders which were present in both stillborn and liveborn infants had a much lower male:female ratio in the former group. The ratio for infants of poor families was 1.17:1, nonpoor 1.40:1, whites 1.34:1, blacks 1.22:1, Puerto Ricans 1.22:1, and Mexican-Americans 1.23:1. The ratio for liveborns with infections of antenatal