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

origin was 1.15:1 whereas the ratio for infants with infections acquired after birth was 1.58:1. Removal of the cases with antenatal infections from the analysis eliminated much of the sex ratio difference between whites and nonwhites and between the poor and the nonpoor. A decreasing incidence of such antenatal infections may well explain why the ratio of male to female neonatal deaths is increasing in the U.S. and other industrial societies and why U.S. poor whites and nonwhites have fewer excess male deaths than their more prosperous counterparts.

Preschool nutrition survey: Heights and weights of children. GEORGE M. OWEN and A. HAROLD LUBIN. *Ohio State Univ., Coll. of Med., Children's Hosp., Columbus, Ohio.*

Between November, 1968 and December, 1970, some 2300 children between 1 and 6 years old were examined in connection with overall evaluation of nutritional status. Measurements were made of height, weight, thoracic fatfold, and head circumference. X-rays of the hand-wrist were taken to assess skeletal maturation. Heights (standing) and weights were measured by one of five nurses using standard techniques. Data collected between November, 1968 and December, 1969 were analyzed, percentile (10th–90th) values for heights and weights were computed, and distance growth charts have been developed. These charts were based on 1106 children (538 girls and 568 boys with birth weights >2500 g) who represent a national probability sample. Median, 75th, and 90th percentile values were the same or slightly below those of the Boston chart while 25th and 10th percentile values were somewhat progressively more skewed below the Boston norms. Distribution of height values by percentiles shows some relationship to income as do various parameters of dietary intake and biochemical assessment.

Percapita income	Children	<10th P	<25th P	<50th P	<75th P	<90th P
(dollars/yr.)	(no.)			(no.)		
≤900	235	22	56	112	165	206
901–1300	238	23	52	107	175	218
1301–1900	306	24	67	137	225	268
≥1901	327	20	53	137	224	287

A test for lead poisoning based on increased osmotic resistance of erythrocytes. Q. H. QAZI and D. P. MADAHAR. *Downstate Med. Ctr., Brooklyn, N.Y.* (Intr. by E. S. Smithwick).

The proposed test is based on observations that lead, *in vitro* and *in vivo*, increases the osmotic resistance of erythrocytes.

Blood samples were collected in heparinized lead-free tubes from 32 patients admitted to the hospital with lead poisoning (blood lead level of 0.06 mg/100 ml, or higher). Samples obtained from 30 blood donors, 27 children without lead poisoning and 10 children with iron deficiency anemia served as controls. A hemoglobin pipetteful of blood is added to each of two tubes, one containing 5 ml of 0.4% buffered sodium chloride solution and the other, 5 ml of double distilled water. After 20 minutes, the tubes are centrifuged and the optical density (OD) of the supernatants determined at 540 mμ. The results are calculated and expressed as follows:

(OD in 0.4% saline ÷ OD in water) × 100 = % hemolysis

The results show that the mean hemolysis in children with lead poisoning (49.9, SD 18.7) was distinctly lower ($P < .01$) than that in blood donors (95.2, SD 5.2), in unaffected children (92.2, SD 6.0) and in children with iron deficiency anemia (87.1, SD 9.2). The test identified 28 of 32 children with blood lead levels of 0.06 mg/100 ml, or higher, and each of ten children with blood lead levels of 0.09 mg/100 ml, or more.

Further data, derived from continued use of the test, will be presented.

Diagnostic value of laboratory tests in progressive protein malnutrition. VIJAY KUMAR, KEITH B. HAMMOND, and H. PETER CHASE. *Univ. of Colo. Med. Ctr., Denver, Colo.*

The order and magnitude of alterations in laboratory values occurring with progressive protein malnutrition are presently poorly understood. Four young female pig tail monkeys were given a 34% protein diet and four other young females an isocaloric protein free diet for 20 weeks. Fasting blood samples were obtained every 2 weeks for biochemical analyses. The mean body weights in the two groups were identical initially, but the protein deprived group steadily lost weight and were 20% below controls after 10 weeks and 39% after 20 weeks. Edema was present 15 weeks after initiation of protein deficient diet. The BUN and serum amylase levels were the first tests affected, and were significantly decreased ($p < .01$) after only two weeks of protein free diet. They were decreased a mean of 64–96% during the 20 weeks of observation. Serum transferrin levels have been reported to be the best screening test for kwashiorkor (Lancet, p. 392, 1969), but in this study were not significantly altered until after 6 weeks of protein deprivation. They were thereafter decreased a mean of 24–33%. Progressive reduction in total serum proteins (6.55 ± 0.51 g% at 2 weeks, 4.62 ± 0.78 g% at 20 weeks) and serum albumin (3.27 ± 0.39 g% at 2 weeks and 1.35 ± 0.44 g% at 20 weeks) occurred in the poorly nourished group, but were not consistently lower than control values until after 10 weeks of protein deprivation. Blood cholesterol levels were decreased significantly only after 16 weeks of protein free diet, and alkaline phosphatase and glucose values were not altered at any stage of deprivation. This study indicates that reduced BUN and serum amylase levels are good indices for the diagnosis of early protein malnutrition, whereas, reduction of transferrin, total serum proteins, and albumin are indicative of sustained deprivation.

Recognition of the humanistic student entering medical school. K. C. MORTON and S. J. SCHAEFER. *Univ. of Calif., Irvine, Calif.* (Intro. by R. Greenberg).

Twenty-two of 57 freshmen medical students chose to attend a pediatric clinic once a week in the evening for six months. Responses to a structured questionnaire were scored on a positive-negative attitude continuum (from −7 to +7), a high score indicates a positive attitude. Those students electing to attend an evening pediatric learning experience without credit, scored 4.15 before and 4.30 after exposure. Those who did not attend the presentations scored 2.44 and 2.46 on the two questionnaires. The humanistic student can be identified on admission to medical school and those with this viewpoint may be guided towards appropriate learning experiences. The findings of this study indicate that it is possible to assess differences in expectations of students early in their first year and it is necessary to provide alternative electives to develop differing specialized interest.

Air and blood lead and the G6PD deficient. CAROL R. ANGLE and