titers. The 3 patients with high titers and a decrease in growth velocity all had an isolated hereditary growth hormone deficiency.

In conclusion, most patients with negative, low, or medium anti-HGH antibody titers grow adequately. The presence of high level titers inhibited the growth response to HGH administration.

High Affinity Estrogen Receptors in Uterus of Early Malnourished Rats

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We have found that marasmic malnutrition in rats permanently decreases uterine cell number. On the other hand, a decrease of total plasma estrogen levels in mothers of small for gestational age newborns has been demonstrated. We have found, also, decreased levels of sex hormone binding globulin in these mothers, suggesting lower levels of free plasma estrogens. As an index of hormone action upon the target cells, we studied uterine estradiol receptors of early malnourished rats. Malnutrition was induced in rats by increasing litter size to 18 pups per dam from birth until weaning. These offspring received a 22% protein diet from days 21–90 of life. Control dams nursed 6 pups, which were fed the normal diet after weaning; all animals were killed at 90 days. Uterine estradiol receptors were measured according to the technique of Feherty *et al.*, recovering bound estradiol with DEAE-cellulose filters instead of dextran-charcoal. Estradiol binding capacity of the uteri of marasmic rats was decreased compared to normal, age-matched controls expressed as picomoles per mg tissue ($8.26 \pm 2.76 \times 10^{-4}$ vs. $5.16 \pm 1.96 \times 10^{-4}$, respectively, $P < 0.025$), picomoles per mg protein (0.262 ± 0.0055 vs. 0.0153 ± 0.0054 , respectively, $P < 0.001$), or picomoles per DNA ($1.96 \pm 0.80 \times 10^{-4}$ vs. $1.10 \pm 0.28 \times 10^{-4}$, respectively, $P < 0.025$). These results show that the number of estradiol receptors in the uterus of rats malnourished early in life is decreased. This is more evidence that early malnutrition produces damage in the uterus of the rat.

Bioavailability of Heme-Iron Preparations Derived from Bovine Red Blood Cells

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In the past, milk has been fortified with inorganic iron compounds. The bioavailability of these compounds for absorption is altered according to the properties of the vehicle. The purpose of this work was to study the possibility of fortifying whole milk with organic iron obtained from fresh bovine red blood cells. The organic iron preparations used in this study were: 1) hemoglobin with stroma, 2) hemoglobin without stroma, 3) hemin. These compounds are soluble in milk and water (with the exception of hemin), do not alter the flavor of the milk, and give the milk a chocolate color. The absorption of these preparations was studied using both whole milk and aqueous solutions as vehicles by a double isotope technique. Seventy healthy infants from 6–18 months old were distributed into five groups: 1) hemoglobin with stroma in whole milk, 2) hemoglobin without stroma in whole milk, 3) hemin in whole milk, 4) hemoglobin with stroma in water, 5) hemin in water.

On day 1 each group was given 150 ml milk or water to which were added 2 mg Fe in the form of the heme-iron being studied (hemoglobin with stroma, hemoglobin without stroma, or hemin) and the same product prepared from calf red blood cells that were biologically marked with ^{55}Fe ($0.5 \mu\text{Ci/kg}$). On day 2, the infants received 50 ml of a ferrous-ascorbate solution that contained 2 mg iron (FeSO_4) marked with ^{59}Fe ($0.1 \mu\text{Ci/kg}$). Absorption was calculated 14 days later according to circulating radioactivity. The heme-iron preparations in milk showed a geometric mean absorption of 20%. The ratios among the formulas of day 1 in milk and day 2 did not show statistically significant differences. No difference between the absorption of hemoglobin in milk or in aqueous

solution was observed; however, the hemin showed a lower absorption value ($P < 0.01$) in aqueous solution. It can be concluded that fortification of whole milk with hemoglobin preparations is feasible. The addition of hemoglobin preparations to milk appears to be an excellent combination because of the organoleptic characteristics and high bioavailability of iron.

Study of the La Brosse Spot Test for 3-Methoxy-4-hydroxymandelic Acid (VMA)

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The object of this paper is to compare the La Brosse test with the quantitative urinary VMA measurement (Pisano's technique). Substances whose breakdown products appear in the urine and give false positive results were eliminated from the diet. Seven hundred 24-hr urine samples belonging to 580 patients were studied. Fifty-six patients had sympathoblastomas, 15 pheochromocytomas; the remaining several pathologies were not related to a catecholamine increase. Four hundred twelve negative, 132 intermediate, and 156 positive reactions were obtained. The negative tests had normal VMA in all cases except in five urine samples (false negative) belonging to three patients with pheochromocytoma who had increased VMA (between 15.4 and 38.6 mg/24 hr). The intermediate results had normal VMA in all cases except one patient with pheochromocytoma (VMA 18.4 mg/24 hr). Among the positive tests, 70 showed increased VMA and 86 normal VMA (false positive FP). The former results belonged to 55 samples from sympathoblastoma patients and to 15 from pheochromocytoma patients. The FP occurred in 15 patients treated for sympathoblastoma and in 71 patients without any pathology associated with a catecholamine increase. Of the sympathoblastoma patients, 30 were studied before any treatment (group I) and 26 after treatment (group II). In group I, all but 1 yielded positive tests: 28 had increased VMA and 2 had normal VMA. From this group, 16 patients were followed during treatment: 11 continued with positive tests and increased VMA excretions and 5 converted to negative tests and normal VMA. In group II, 19 were negative, 4 were intermediate, and 3, all with normal VMA, were positive. Only one patient persisted with positive tests in the subsequent evaluations.

In conclusion, the La Brosse test is a practical screening test to detect and follow the course of treatment in patients with sympathoblastoma who initially had positive tests and increased VMA. All these results must be interpreted with caution because there are false positive results and a 15% of sympathoblastoma patients have normal VMA. The false negative results (1.2%) were observed in 17% of pheochromocytoma patients. The intermediate reactions were associated with normal VMA excretions except in one pheochromocytoma patient.

Pathology of "Uninvolved" Renal Parenchyma in Nephroblastoma

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Two hundred twenty-five primary renal tumors in children were histologically examined; 191 of these were nephroblastomas (Nbl) (Wilms' tumor). In 61, sufficient residual parenchyma was available for study. In a 5-month-old girl admitted with corticoid-resistant nephrotic syndrome, an Nbl was found and a nephrectomy was performed. In the uninvolved renal tissue a severe diffuse glomerular mesangial sclerosis was present; it led to her death in renal failure 6 months after onset. In 12 other specimens nephroblastomatosis was present. The most common lesions were subcapsular metanephric hamartomata (either as discrete nodules or as diffuse involvement of the superficial cortex). They were frequently associated with nodular renal blastema and occasion-

ally with papillary microadenomas two patients or "Wilms' tumors" (three patients). In 3 of the 12 children another Nbl appeared in the contralateral kidney. Another patient, who died shortly after surgery, also had nephroblastomatosis in the remaining kidney. One patient was alive and healthy 3.5 years postoperation; another died with metastatic disease and autopsy was not performed, four were lost to follow-up, and in two nephrectomy is too recent for evaluation. The importance of careful examination of "uninvolved" parenchyma in Nbl is stressed in order to detect other nephropathies that may adversely influence prognosis, and to detect those children in high risk of developing bilateral tumors.

Transportation and Accessibility to Medical Care in Ambulatory Children with Renal Diseases

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The means of transportation from the interior of the country to the hospital in the capital, located in the southernmost part of the country, were considered in a prospective study held in the winter months for 65 unselected consecutive outpatient visits to the hospital of patients with chronic nephropathies. The bus was used for transportation in 50 cases, the railway in 13, and the car in 2. Most of the patients had to use more than two vehicles. Forty-three children (66.15%) traveled directly to the capital (group I) and 22 children (33.8%) had to stay overnight for 1 or 2 nights (group II). Sixteen children of group I (37.12%) had to leave home at 5:30 am or earlier. The mean time for the whole trip to the hospital was 2:25 hr (range 1:10 hr to 6 hr) for group I and 22:15 hr (range 11:15 hr to 73:15 hr) for group II.

The ratio of patients to total population of the corresponding geographic areas (per 100,000) was: 8.84, 3.91, and 1.30 for the distance from home to hospital, 40 to 100, 101 to 200, and more than 200 km, respectively. These ratios indicate that it is impossible for some children to travel to the capital.

For 56.9% of the families, the trip was very expensive; 35.9% of the families required financial help. Ten out of 62 families were known to have missed other appointments due to transportation and financial difficulties.

The negative impact of distance and transportation difficulties on clinic attendance by chronic outpatients might be reduced with more logical consultation hours, mail or telephone communications, and with medical care given by properly trained local physicians.

Even in small countries like Uruguay, without geographical ruggedness, transportation is one of the most important barriers to medical care.

Protein Evaluation of Extrusion-cooked Sweet Lupine (*Lupinus albus*)

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In previous studies conducted by our group, it has been demonstrated that the beans of two species of sweet lupines (*Lupinus luteus* and *Lupinus albus*) contained about 40% protein, 11.5% of crude fiber and a low level of alkaloids (0.05% lupanine). This protein is poorly balanced due to its low methionine content. In this study, *Lupinus albus* beans were mechanically treated to reduce the fiber content from 11.5–2.7% and were divided into

two portions. One was raw and the other was extrusion cooked in a Wenger X-25 extruder. Both were analyzed for their chemical composition, protein efficiency ratio (PER) and digestibility. The raw sample was found to contain about 40% protein ($N \times 6.25$) and 12% ether extract. These values were practically unchanged by processing. The protein efficiency ratio significantly increased in the cooked-extruded sample from 0.50 ± 0.02 to 0.76 ± 0.05 . Supplementation of two samples with 0.3% DL-methionine increased the protein quality to values similar to casein (PER 2.60 ± 0.05 compared with 2.54 ± 0.07 casein). Digestibility was not affected by extrusion cooking (76.5 ± 1.9 and 77.8 ± 0.7 for raw and extruded-cooked samples, respectively). These results indicate that sweet lupine may become a valuable protein source for human or animal feeding provided that the deficiency of sulfur-containing amino acids is corrected. Our work also highlights the advantage of extrusion cooking in the processing of this legume.

Sociological Analysis of the Families of Severely Malnourished Children

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Malnourished infants in Chile receive comprehensive treatment through a Program of Nutritional Rehabilitation Centers, which involves not only the rehabilitation of the infants but also that of their families. This program is planned so that after discharge from the centers, children will continue developing normally within their home environment. A careful analysis of the basic socioeconomic and cultural characteristics of the families in which malnutrition occurs becomes a prerequisite for an accurate diagnosis and treatment of similar groups. The design of this study entails an in depth, descriptive analysis of the families and an investigation of the relationships that may exist among the variables studied. A sample of 42 families of greater Santiago was analyzed. All of them had infants admitted to a Nutritional Rehabilitation Center. A structured interview was administered to the mothers by specially trained social workers during the period from January through March 1977. It was found that: 1) a majority of mothers were under medical supervision during pregnancy; 2) the weight of the infants at birth was significantly greater than 2,500 g; 3) the duration of breast feeding was less than 1 month in 64.2% of cases; 4) 62% of the mothers had no knowledge of the normal parameters of infant development; 5) almost a quarter (21%) of the families were classified as cases of extreme poverty. They provided very little sensory stimulation to their offspring, in part due to a very deficient physical home environment, 6) Verbal communication between the members of the household was very poor and hindered the rehabilitation of the patient and the family.

Acute Chagas Disease in the Infant

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Acute Chagas disease is greatly variable in its clinical manifestations. The acute stage is the most important, because the specific treatment has its best action in the acute stage. An early diagnosis is essential. In the last 7 years, in the Pediatric Center "Albina R. de Patino" 108 children have been hospitalized with acute Chagas, all of them with positive parasitology (thick drop, fresh drop, or Strout). An analysis has been done of the ages of the infants, the clinical manifestations of acute Chagas, the criteria for diagnosis, and experience in the use of the drug, Lampit (Nifurtimox).