

*Symposium on*

The Interrelationship between  
Pediatric Disorders and Nutrition

THE science of nutrition has perhaps contributed more to modern pediatrics than to any other branch of clinical medicine. The child is more susceptible than the adult to dietary privations. His reserves are more limited and his mechanisms for the digestion and assimilation of foodstuffs are more vulnerable. The striking reduction in infant mortality which occurred in well-developed countries from the middle of the last century onward was in large part achieved through a better understanding of nutrition.

Pediatric nutrition began with empirical observations on infant feeding in health and disease. An important advance was initiated in the last century by the German school of pediatricians, notably Czerny, who carried out pioneer studies of infant metabolism and observed the effects of unbalanced diets. They had a great influence on American thought and practice, but it was not until after the turn of the century that an American school developed under John Howland where biochemical techniques were applied to clinical problems. The techniques of blood chemistry came at this time and added greatly to knowledge obtained from balance studies; they were particularly fruitful in the field of electrolyte metabolism.

The study of nutrition in small experimental animals and the discovery of the vitamins and their corresponding deficiency diseases followed quickly upon this and produced a great change in pediatric thinking. The importance of ascertaining and meeting the requirements of the various nutrients was now recognized. The emphasis was no longer on tolerance and intolerance of foods for it became clear that the syndrome formerly attributed to toxic products from undigested food—"alimentary intoxication" was in reality a deficiency syndrome caused by dehydration. Parenteral nutrition made great strides in the succeeding years in the attempt to provide nutrients which a disordered intestinal tract would not readily assimilate.

It seems as if our knowledge of the fundamental nutritive requirements of the growing human being is nearing completion. Perhaps one or two additional accessory factors will be discovered, but the success with feeding synthetic diets for considerable periods of time makes it seem unlikely that there can be many such. Our goal of a completely adequate parenteral nutrition which will supply these nutrients adequately



by the parenteral route, as yet unrealized, seems not so far off.

The big problem of nutrition today is that of the nutritional requirements in disease. There are many indications of special nutritive requirements for particular diseases, and only a beginning has been made in studying them. Requirements in disease may differ not only quantitatively but qualitatively. In the last analysis cells die because some nutrient is not available. It may be some substance, important in intermediary metabolism, which the normal cell is able to manufacture which in the presence of disease cannot be manufactured. Thus a whole host of "conditional nutrients" required in particular disease states may in time be discovered. Some of these will perhaps be complex large molecules that cannot readily be supplied from without, but it may be possible to supply parts of the molecule—co-factors—that will serve the purpose. A particularly fruitful area for research in this field is the immature infant who lacks a number of enzyme systems possessed by his more mature brother. It is not unlikely that there exist for him a variety of special vitamins not needed in the older subject.

In selecting contributors to this symposium we have attempted to include topics in which nutritional therapy is a matter of practical importance. We have also endeavored to illustrate different categories of nutritional problems. The paper by Scrimshaw and associates on protein malnutrition defines a condition which is at present in the forefront of interest as a public health problem in technically underdeveloped countries but which is by no means confined to them. The paper by Pratt deals with the current status of water and electrolyte requirements. Those who feel that human milk has lost all its mystery may have their complacency a little disturbed by the observations of Mellander and Vahlquist which point to particular chemical factors of nutritional value in that fluid. The paper by Lahey highlights an area in which practice has not kept pace with nutritional knowledge. Iron deficiency, it seems, is still with us and newer types of nutritional anemia are making their appearance. Vitamin therapy has done us an invaluable service in eliminating rickets and scurvy, but evidence of overzealous prophylaxis should give us pause, as exemplified by "idiopathic hypercalcemia," described by Stapleton.

Three papers in the symposium deal with special nutritive requirements in pathologic states—that by Hunt illustrating a condition in which an excess of pyridoxine is needed, whereas the papers on galactosemia and phenylketonuria deal with conditions in which a reduced quantity of a normal nutrient is the key to therapy. The subject of inborn errors of metabolism is attracting ever-increasing interest since it has been shown that some of them at least are susceptible to correction by diet. In this connection reference should be made to the recent symposium on this subject\* and to the cogent introductory remarks of its editor, Professor Dent.

Although the limitations of space have prevented the inclusion of many areas of pediatric nutrition we hope that this brief collection will prove as interesting to our readers as it has to the editors.

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\* Am. J. Med. 22: 671, 1957.

