approximately 25th percentile). His plasma SM-C concentrations (0.27/0.29 U/mL) were normal for age (range, 0.19 to 2.2 U/mL) and higher than values usually seen in hypopituitarism.4 In response to five days of human GH (hGH), his SM-C level rose into the normal range (4). After six months of hGH his growth velocity increased from 4.3 to approximately 12 cm/yr. These findings illustrate several clinical problems and stimulate a number of ethical questions certain to be encountered with increasing frequency in the future.

The first problem concerns interpretation of SM-C values. As previously emphasized there is a great deal of overlap in SM-C concentrations between normal children and those with hypopituitarism, and in childhood a “low” SM-C concentration usually is not helpful in supporting a diagnosis of hypopituitarism. Conversely, however, SM-C concentration above the hypopituitary range is of diagnostic value in excluding the diagnosis.5 Second, the pharmacologic agents we use to provoke GH release are “artificial” stimuli, which may not reflect the physiologic secretion of GH. Third, current doses and methods of hGH administration (intramuscular or subcutaneous) clearly do not reproduce the physiologic pattern of GH secretion, and provide intermittent “supraphysiologic” concentrations of GH even after an injection of 0.1 U/kg of body weight. Therefore, should it surprise us that some normal children respond to even conventional doses of hGH? The case reported and the clinical condition of acromegaly illustrate that as long as the responding end-organ in a child is normal, “supraphysiologic” concentrations of GH will stimulate linear growth.

The availability of unlimited supplies of hGH can be realistically anticipated. It is imperative that the pediatric community recognize that soon we will have the ability to stimulate growth in many short, otherwise normal children, if enough GH is given over a long enough period of time. Who should receive it? From whom should it be withheld? If one physician will not give it, will another? The ethical implications involved in potential alterations of genetic height in normal children; the expense, morbidity, and discomfort of injections over months or years; and the largely unknown side effects of large doses of hGH on glucose metabolism as well as on vascular and soft tissue all are significant considerations. Although I recognize that there are no easy answers to these questions, I will be looking to leaders in the pediatric endocrinology community to provide us with direction in such matters.

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3. Pediatric Program Catalog. Los Angeles, Nichols Institute, 1982, p 28

In Reply.—

Copeland raises some interesting questions and speculation regarding the treatment of “normal short” children with growth hormone that many, if not all, of the pediatric endocrinologists who treat short children are currently considering.

Regarding the ethical question of who should or should not receive growth hormone, who should give it, who should pay for it, and what are the side effects: information is being gathered and will be forthcoming in stages. A statement prepared by the Ad Hoc Committee on Growth Hormone Usage of The Lawson Wilkins Pediatric Endocrine Society, chaired by Dr Louis E. Underwood, has recently been published. An International Growth Hormone Symposium, followed by an NIH sponsored program on the current considerations of growth hormone usage was held in Baltimore, Nov 20–23, 1983. At least two multicenter national projects involving treatment of “normal short” children, one sponsored by the National Hormone & Pituitary Program (NHPP) and one by Genentech, Inc, are or soon will be underway. This combination of careful observation and data gathering, and circumspect review by experts and many interested and concerned individuals involved in the issues, should lead to appropriate approaches, and provide guidance in this area.

Regarding specific points pertaining to our article, we find no major disagreement. Copeland’s third alternative explanation of the observations we have made, that “normal short children respond to GH . . . etc” is implicit in the former two possible explanations and does not seem to suggest a different mechanism. He describes case 2 as having a somatomedin-C (SM-C) level “normal for age” and then stated that it “rose into the normal range” with GH treatment. Here the difficulty seems to be in semantics of “low.” In our article, we used “low” (SM-C levels) to describe low-normal, not abnormally low or out-of-the-normal-range. Likewise, we would challenge the statement that “in childhood a ‘low’ SM-C concentration usually is not helpful in supporting a diagnosis of hypopituitarism.” If age-appropriate normal ranges are utilized, an abnormally low SM-C will assist in the diagnosis. In very young children, however, the lower limit of normal is at the lower limit of the assay and this distinction cannot be made.

Copeland’s comment on “the ability to stimulate growth in . . . normal children, if enough GH is given over a long enough period of time” may deserve further comment. It is probable that many short children of all kinds may respond slightly or modestly in the short-term to GH, but the long-term effect is absolutely unknown and
whether there will be any effect on ultimate stature remains to be demonstrated.

A final point is to be made regarding the "supraphysiologic" concentrations of GH achieved in our patients by "physiologic" amounts of GH; ie, a dose equivalent to that given a patient with hypopituitarism. These "supraphysiologic" levels are the same as those achieved in GH-deficient patients given GH and which, after one to several years of catch-up, accelerated growth, produce normal growth rates. The dose administered to our patients was given three times per week and, only in the six- to 12-hour period of the 48 to 72 hours between doses, was the GH "supraphysiologic." This is perhaps not unphysiologic considering the high peaks observed with exercise in both our patients.

There is still much to learn regarding normal GH dynamics in normal and nearly normal children, and judging from the number of abstracts on the subject at recent APS-SPR and Endocrine Society meetings, we will all be learning much in the next few years.

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Azarcón and Empacho

To the Editor.—We were pleased to see the case report concerning azarcón-related lead poisoning from the treatment of empacho. Since the time Bose et al composed their paper (September 1982), several new pieces of information have become available.

1. Additional cases of azarcón poisoning have been confirmed in Michigan—four cases, Wisconsin—one case, and California—ten cases. In several of these cases, other children in the extended family have either died of seizures after receiving azarcón in Mexico—one case or had been chelated for lead poisoning several years previously, although no source of lead had been identified—one case. An update on azarcón has recently been published.

2. The term greta, although rarely used to mean liquid metallic mercury, is, in our experience, much more commonly used to mean a yellowish, dense powder that contains approximately 90% lead by weight. This powder is essentially pure lead monoxide, PbO, commonly called litharge. Presumably, the major source of supply for both azarcón and greta is Mexico. However, greta has been sold in Mexican herbal stores in Texas. Greta has been the target of a Food and Drug Administration Class I recall based on this finding. Greta has recently been reported to be sold in the Yakima valley of Washington state, a claim now being investigated by FDA. Greta is given orally for severe empacho, much as azarcón is used. All samples of greta, so far obtained, have contained lead monoxide, with the majority of samples being 100% lead monoxide.

3. Two different studies in Colorado and Los Angeles, in selected populations, have investigated life-time use rates of substances named azarcón and greta. Among migrant children in Colorado, 7% were said to have been given azarcón or greta at some time. In Los Angeles, 8% to 12% of Hispanic households said they had used azarcón at some time in their lives. More information on the use rates along the border is currently being analyzed by Robert Trotter of Pan American University. His preliminary data for Texas, New Mexico, and Arizona indicate a use rate of between 3% and 30% life-time prevalence for azarcón or greta, with an average of about 10%.

4. In light of this information, a public information campaign about azarcón, greta, and lead poisoning has begun. Sunrise Community Health Center, with the funding of Chevron USA Inc., has produced a poster illustrating the dangers of azarcón and greta. These posters are available from Sunrise Community Health Center, free to any physician or primary health care unit that serves Hispanics.

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