A Burgeoning Branch of Clinical Analysis

The subject of trace elements in health and disease has received relatively little attention until recent years. For example, the third (1964) edition of a popular biochemistry textbook (1) devoted a near-trace proportion (0.3%) of its pages to it as such and, aside from their then-recognized role in certain metal-containing (or metal-activated) enzymes, this was about all the average biochemist or clinician learned of trace elements during his schooling.

The availability of refined instrumentation and of new methods of analysis for traces (2) of atomic constituents has changed this, as is elaborated by Dr. Mertz in his paper that introduces this issue. Such tools and techniques have appeared at an idoneous moment in the history of science. They are acutely needed for studying pollution (its extent and methods for control), helping meet the world food crisis (historically, veterinary medicine and plant pathology have supplied most of our store of descriptive and experimental information about trace elements), and, finally, for enlarging and firming up our knowledge of the role and effects of trace elements in human health and disease. It is the latter need that now involves those of our readers who are practicing clinical chemists; more frequently they will be asked to provide and interpret clinical data on the trace elements in disease situations, be they problems of excess (toxicology) or deficiency (malnutrition). In his review of the subject, Dr. Reinhold points out that six trace elements have been established as essential (of a total of 14) in the past five years, and that four more may soon meet the requisite criteria.

The Editors, believing that clinical chemists generally may not be fully aware of the increasing importance of the subject, directed last April that a special issue be assembled on the analytical and interpretive aspects of trace elements in clinical chemistry, patterned on our preceding special issues on toxicology and drug assay (February 1974) and radioimmunoassay (February 1973).

We think that specialists of many other sorts will also find this issue to be particularly interesting and stimulating. The reviews and other papers that appear here suggest, indeed urge, many worthwhile lines of research endeavor. In this time of economic recession, especially, we think that an issue such as this may serve as a sort of symposium. The reader can learn what the experts have to tell him without leaving his laboratory. While he may not enjoy all the benefits of attending a meeting, he also avoids many of the disadvantages, not the least of which is that the "proceedings" are published more quickly and inexpensively (the single-issue price for this issue is $4) than is the usual case.

If these beliefs are correct, making this a "special" issue will have served its intended purpose.

Again, we thank all those who responded to our invitation to contribute to this issue, particularly those who kindly agreed to a delay in publication of their work.

J. S. K.

References
2. It has been officially proposed that the term "trace" refer to a relative content of constituent of not more than 100 ppm (100 parts/10^6, or, in SI units, 100 mg/liter). Further, opinion was invited on the desirability of further terminological subdivision into trace (10^-2–10^-4 ppm), microtrace (10^-4–10^-7 ppm), nanotrace (10^-7–10^-10 ppm), and picotrace (10^-10–10^-13 ppm). Analytical Chemistry Division, Commission on Analytical Nomenclature, IUPAC, Recommendations on nomenclature of scales of working in analysis. Information Bulletin, Number 18. IUPAC, Secretariat, Bank Court Chambers, 2/3 Pound Way, Crowley Centre, Oxford OX4 3YF, U.K., February 1972, p 2.

The alchemical symbols at the top represent (left to right) zinc, mercury, lead, antimony, tin, nickel, iron, bismuth, and copper.