

December 15, 1941.

Mr. William M. Springer,
Director of Research,
Bristol-Myers Company,
Hillsdale, New Jersey:

Dear Mr. Springer:

The question which you have raised concerning the use of lead foils, sheets of lead covered with tin, or lead containing alloys in the fabrication of tubes, is one which has been called to our attention previously. It seems probable that these uses of lead, which have previously been discouraged in the United States, will increase somewhat under present conditions. I do not anticipate that any very great dangers will arise from this source. On the other hand, I believe every distributor who makes use of these materials will be running certain risks from both valid and fictitious claims of injury. It will be necessary, therefore, to examine each situation rather carefully and to determine whether or not one can safely package a given material in this fashion. In the case of materials which will not be taken internally, little or no problem exists. However, whenever the material is used in the mouth or is swallowed, the result is open to question. Both designing and misguided persons have been responsible for claims of injury from lead absorption from a variety of sources, and some of the claims that have come to our attention have been so fantastic as to be palpably unreasonable. Yet, some of these have caused considerable trouble and expense. However, I do not wish to stress the invalid claims unduly, since there can be no question about the actual hazard of increasing the daily intake of lead by a series of small amounts from numerous sources. That is what will almost certainly occur during this period, unless care is exercised.

The hygienic problem, in relation to lead absorption in the community as a whole, arises from the fact that lead occurs naturally in most food materials, and is added as a contaminant to a large number of food items. The result of this is that we now take in approximately $1/3$ milligram of lead per day. All of the evidence indicates that this is not hazardous. On the other hand, it seems probable from some rather extensive observations which are now being brought to completion, that the regular ingestion of quantities in excess of $1/2$ milligram per day might be potentially dangerous. Certainly this is as high a daily intake as one would be willing to accept as doubt-

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fully safe. Quantities as much as a milligram per day of lead in soluble form would be dangerous. From a variety of causes, at present, the lead content of the food may be as much as 2 or 3 milligrams per day, occasionally. One would not wish to see the frequency of this occasional occurrence materially increased. It is not a question, therefore, of what quantity of lead is contributed by lead containing tubes, or what contribution is made by this, that, or the other individual item. It is rather a question of the overall opportunities for lead intake, and it is certainly important in relation to the public health to control these opportunities by the elimination of unnecessary chances for exposure.

There have been a number of new sources of lead contamination, but, in general, it may be said that the methods of handling and processing foods in the United States have so improved that the increase in lead intake from new sources has been neutralized largely, or perhaps, entirely by decreases brought about by careful procedure. For example, the Europeans have spoken rather freely and inaccurately about the contamination of American foods from the extensive use of tin cans, whereas, the facts in the matter are that while our foods are contaminated with tin from this source, they receive only a negligible contribution of lead. Actually, our evidence indicates that American foods are not contaminated with lead in handling, processing, and cooking, to quite the extent that European foods are.

We have a fair amount of information on the quantities of lead in American foods and on the sources of this lead. I refer you to an article in the Journal of Industrial Hygiene, vol. XV, 1933, which gives extensive data on the lead intake of Americans and the sources of this lead. Unfortunately, my supply of reprints of these articles is exhausted, and I can not send you reprints. I am sending you some more recent articles, the reprints of which are available, and I think these will give you some useful information. I should also make mention of a British review of this subject by G. W. Monier-Williams, "Lead in Food", Reports on Public Health and Medical Subjects, No. 88, 1938.* The latter refers more to the British scene than to the American, and especially in one item, namely, the lead content of drinking water; it is incorrect so far as American water supplies are concerned, with the exception of a very few regions in this country (New England towns), in which rather extensive drinking water systems have been constructed of lead pipe in an earlier period.

I trust that I have given you at least some of the information desired and that I have acquainted you with a point of view on

* British Ministry of Health, obtainable from His Majesty's Stationery House, London.

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this problem, which I believe is based soundly on experience.

Very truly yours,

Robert A. Kehoe, M. D.

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