

November 21, 1942

Mr. Ernest S. Cloves,
Bridgehampton,
Long Island, New York.

Dear Mr. Cloves:

Unfortunately the talk that I gave on the toxicity of metals to the Yale School of Medicine was not prepared in manuscript form and is not likely to be for some time. However, I am glad to send you an outline which contains a number of facts that may be of interest to you, and perhaps this will serve your purpose in part. On the question of the tolerance for copper in water, I am afraid I can not give you specific information. Copper may be ingested in considerable quantity without apparent risk, and inasmuch as copper poisoning does not occur in industry, it is quite apparent that the human animal can take in quite large quantities of copper without injurious effect. No doubt this is partly because copper is absorbed poorly from the alimentary tract. It is also true, however, that while copper salts are very poisonous to certain unicellular organisms, and also to plants, it is not very toxic for the complicated animal organism.

You are probably aware of the fact that the upper limit for the lead content of drinking water is generally set at 0.10 mgs. per liter. Actually, this is too high for general use, but that is the accepted upper level. There is no doubt that a considerably higher copper content would be permissible. I should not like to say arbitrarily what this should be, and I know of no investigation which could be said to answer your question adequately.

I am sending you two articles, one giving our observations on the normal level of a number of trace metals in biological material, and another a review article which gives a general resume of the available information. Perhaps these articles will be of some help and they also provide fairly extensive reference to the subject.

Very truly yours,

Robert A. Kehoe. M. D.