

January 13, 1964

Mr. Clair D. DeLong
Mifflin County Agricultural Extension Association
7 West Fleming Avenue
Lewistown, Pennsylvania

Dear Mr. DeLong:

I hasten to reply to your letter of January 9th in order to get certain things underway as soon as you return to your office. In view of the prior temporal relationships of the matter under investigation, the brief further delay will hardly be of significance, and it seems best to continue to deal with you rather than any other person, so as to avoid any waste of further effort through haste.

The important matter, in my view, is to obtain some completely trustworthy analytical information. (This is not to say that this Laboratory is the sole source of such information, for this, I know, is not the case. On the other hand, it is necessary to know the background of everyone who does work of this kind, for very few analysts have had the experience that is necessary to deal with real precision with biological materials, and therefore a large proportion of the results which we encounter in practice and in the literature are not to be trusted. If I appear to be somewhat arbitrary in this attitude, it is because we in this Laboratory have been at this for more than thirty years, during which we have had many unfortunate experiences with analytical results and their misinterpretation.)

The information which you have given me fits together very well into a plausible explanation of the situation. It is not necessary, therefore, to go through the entire set of facts, but by a judicious and representative choice of materials to verify these facts as a group. (At present, I hardly think it necessary for us to make an on-the-spot survey of the situation, although we could do this if, in the judgment of those most concerned, it is desirable. This would involve (1) certain analyses of the effluent air from the smelting operation at the point of its descent to the land and vegetation; (2) analyses of certain bits of representative vegetation (forage, grain or fruit); (3) blood or urine or milk, preferably blood from animals selected as representative of exposure; and (4) analyses of certain tissues of killed or deceased animals, including at least one suffering from the suspected disease.) I tend to trust the diagnostic impression of the veterinarians more than I do the analytical data, while knowing at the same time that the diagnosis of lead poisoning in various animals is ^{not} too easy at best and is often confused with certain other diseases especially those involving the central nervous system.

As to the desired samples. The best for our purposes would be individual samples from the cow that is ill, if it may be presumed that this cow was subjected to the relevant exposure, and that her illness is related to that under

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investigation. Blood, collected in our containers, by our methods (which will obviate contamination) should be obtained. Urine collected directly into a container which we would supply, would also be useful. (I am forwarding containers for this purpose with instructions for their collection. The methods appear not to be suitably applicable to cattle or veterinary practice, but the quantities indicated in our instructions will be sufficient, and the important point is the avoidance of contamination. Analytical precision is of no avail, if there is any chance for contamination of the material to be analyzed.)

If the animal dies or is killed, we should have samples of certain tissues, collected in individual containers with care to avoid any extraneous matter. We have found glass-topped Mason jars, cleansed with ordinary care and rinsed in distilled water, to be suitable for obtaining samples. These samples can be shipped in a fresh state, or if there is delay in preparation or transit, they can be fixed (preserved) by immersion in a 10 percent (clean) solution of formaldehyde. The latter as provided commercially by chemical supply houses or as embalming fluid, is satisfactory from the aspect of its lead content. The tissues to be desired are (1) liver, (2) kidney, (3) brain, (4) musculature, and by all means, (5) bone (rib, vertebra or long bone of legs). Not all of these are absolutely necessary, but each contributes something, and in this type of situation, bone is essential. Of the other tissues, the liver is the most important, but the pattern of the distribution is also highly important in most instances.

The urine (or for that matter) the blood of persons in the area will probably be of no help, since the exposure here is not related importantly to the air-borne lead breathed by persons or animals, but by that deposited on food, especially forage. That eaten by the people in the vicinity will be affected to only a limited and, usually, an insignificant extent.

The lead content of the milk of the cows will not be of practical value, although there would be some scientific interest in it. I do not advise your bothering with it, unless scientific curiosity is an impelling factor.

Any sample or samples (limited number) of forage (silage, hay) or of grain that can definitely be linked with a known period of exposure to the effluent from the plants, will be useful to us. At the same time, one or more (control) samples of uncontaminated products from the same region, but not subject to this source of contamination would be helpful. As I have indicated above, the containers for such samples can best be pint Mason jars, with glass tops, that have been cleaned as suggested.

I believe this will cover the situation, at least as a starter. Satisfactory results from such analyses will likely yield clinching facts.

Cordially yours,

RAK:vr

Robert A. Kehoe, M.D.

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P.S.

Our charges for these services will be based on our cost-per-sample for services rendered, i.e. \$12.50 per sample. This means just what is indicated, that this is what it costs us to do the work.

RAK