

NEW YORK

KE 0012757

February 15, 1967

Mr. Leonard L. Huxtable
Ethyl Corporation
100 Park Avenue
New York, N. Y. 10017

Dear Len:

I have reviewed the A.P.I. White Paper on "Lead in the Environment" and while I agree that this is a pretty good job, generally, there are some things in it that are not quite as they should be. I do not suppose, from what you have said, that editorial changes would be welcomed at this time. However, for such use as it may be I have commented in some detail on parts of the paper, especially the early parts that deal with physiological facts. It is too much to expect that all of these matters would be dealt with correctly or with complete understanding, and I do not view the details with great concern. I have criticized certain statements, however, in the spirit of a severe outside critic who had no reason to be considerate of anything but the stern facts. After all, matters of form and style are important in a document of this type, and it is also essential to be extremely careful not to be defensive in any matter.

My comments are entirely directed to yourself and the Ethyl "family." If you, or others, believe that any useful purpose can be served by bringing any of them to the attention of A.P.I., have no hesitation in doing so. There is no doubt in my mind that the document can be improved, but I hardly think that the matters to which I refer will be regarded by many people to be important, or even worthy of note. Unfortunately, precision in matters of this sort is not common enough in our day to be regarded as essential, and while this attitude is responsible for much of our current confusion in many matters, it is not likely to undergo much alteration in the near future.

I attach my notations, which I have undertaken to put in such form as not to hurt any tender feelings.

Sincerely yours,

Robert A. Kehoe, M.D.
Professor Emeritus of
Occupational Medicine

RAK:wp

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I. HOW LEAD CAME TO BE USED AS A FUEL ADDITIVE

Page 2, Sub-Heading "Two Surgeon General Committees Reported Lead Use" should be modified, as for example, Two Official Reports Issued by United States Public Health Service.

Page 2, Full Par. 4 U. S. Surgeon General should be Surgeon General of U. S. Public
Line 3 Health Service.

(Same) Line 4 This was not at all the first step, but was rather a confirmation of the investigation of Edgar and Kehoe carried out in 1925. Could be made correct by changing sentence to read "The first official step" etc., etc.

Page 2, Par. 5 Should be not "in a plant," but "in plants" (there were several
Line 3 plants in which poisoning and fatalities occurred).

(Same) Line 7 Should be "which were accepted (in principle and implemented) by" etc. These regulations in large part were irrelevant and inapplicable. They were accepted in the spirit in which they were suggested, and were modified suitably, so as to accomplish the intended purpose.

Page 2, Par. 6 This paragraph is a correct quotation from the Public Health Service. It is, however, in fact, untrue and misleading in two important respects: (a) there were cases of poisoning (actually some 80 in continental U.S.A. in connection with tank cleaning operations), and there were several cases in manufacturing, and these were reported to the P.H.S., but for some reason the writer of this statement was unaware of these facts, as well as many others; (b) the recommended regulations, which, as stated above, were irrelevant and impractical, had nothing to do with the control of the hazards except in two important respects: (1) the mere issuance of "proposed" regulations by the Committee put authority behind those that were issued by the Medical Department of Ethyl Corporation, and (2) the one important recommendation of the Committee, namely, that mixing operations should be limited to sites at which large volumes of gasoline were to be handled, made it possible to handle this difficult procedure by limiting the mixing to refineries.

Page 3, Par. 2 "This Committee, (of) which" instead of "This committee, which."
Line 1

(Same) Line 6 "because of lack of medical data" should be "because of the inadequate coverage of the country by the available medical and environmental information."

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II. DEVELOPMENT OF KNOWLEDGE, ETC.

Page 4, First Item
Par. 2; Line 1

The amounts of lead in food and beverages are not "tiny" in the biochemical or physiological sense, and the term is misleading. The quantities range from less than 0.1 to 4.0 mg. per day. "Tiny" should be "small" so as not to emphasize the diminutive aspect of the matter.

Page 4, Next to
Last Par.

This is an unfortunate quotation. Herbert Stokinger, Ph.D. is an able toxicologist, but he has little knowledge of the general problem of lead poisoning in the U.S.A. I was compelled to take serious exception to what he said and to point out that lead poisoning is common in U.S. lead trades, and that it is untrue that the "average" industrial exposure in most work categories was below the acceptable levels. A large portion of the lead industry does not meet hygienic standards, even now, and some, notably those engaged in the reclamation of secondary lead, have grossly dangerous conditions for their workmen. This was, perhaps, the poorest (in terms of the facts) statement made in the symposium by a professional person of standing in the scientific community. This, I may say, is a highly unusual position to be occupied by Herbert Stokinger, who should not have been asked to deal with this subject, unfamiliar to him.

Page 5, Part I
Part 2
Part 3
Part 4

This entire discussion is poorly expressed, and is incorrect, as well, in a number of its statements. As examples of the latter, (1) the finding of 80 micrograms per 100 grams of whole blood is not just a warning. Cases of lead poisoning occur at this level. It is a clear indication of dangerous environmental conditions, and of imminent danger of intoxication in the person so affected. (2) There is no such thing as a first or "next thing," in the use of analytical methods; one employs the appropriate procedure at the onset. (3) The concentration in the blood of poisoned persons ranges from 80 (rather than 150) to 800 or more micrograms per 100 grams. This section should be rewritten in its entirety, since it is ambiguous and misleading.

Page 5
Last Par.

The first sentence is true in the U.S.A. but not in certain other places, notably Italy. This should state "in the U.S.A.," since otherwise one would have to be specific as to other countries. This entire document relates to the U.S.A.

The second sentence should be modified to say that "Similar good records have been made in certain other segments of the lead industry." The statement as it stands is simply untrue, for it implies all other segments to the casual reader.

Page 6, Part 1
Line 4

"Diet intake" should be "dietary intake."

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III. THE THREE-CITIES SURVEY

- Page 7, Par. 3 "Tiny specks of dust - unseen and relatively sparse" very greatly minimizes this situation. The air of our cities, almost generally, contains much more particulate matter than is desirable and necessary. It is inadvisable in such a document as this to minimize this situation. It sounds too much like an over-defensive attitude.
- Page 7, Par. 4
Line 2 The word "never" here is ill-chosen. One should say "is variable from place to place and from time to time in any one place."
- Page 8, Par. 1
Lines 3 and 4 "Studies on cigarette smokers, etc." is too broad a statement. The statistical analyses of data indicate that this may be true, but there is no direct evidence that it is the case.
- Page 8, Last Par.
Lines 3 and 4 "It was found that there was no consistent trend up or down," should be "no consistent trend was found." None could have been, for the reason that no comparable data had been obtained in Philadelphia or Los Angeles. The sampling network of the U.S.P.H.S. has not been comparable. Only in Cincinnati were there suitable data for comparison. Incidentally, in the line above "Service" should be followed by a comma, and "by" should be inserted after "and," to indicate that these were entirely separate sources of information.
- Page 9, Last Par. The latter part of this paragraph should be rewritten to eliminate the phrase "or a fluctuation in the lead levels, which is often observed." This expression is incorrect. No such variation is seen. The results may vary between 0.02 and 0.04 mg./100 grams by reason of physiological variability plus the usual analytical deviation, but not for either of these reasons singly. Such variability as occurred in these instances is the result of an unusual circumstance - an insufficiently cleaned tube for the collection of the blood, or some other factor of contamination in the course of sampling or analysis. Such results occur occasionally in the course of the analytical work of any group in this field of analysis. Such abnormal (in the statistical sense) results, obtained from samples collected from a comparatively homogeneous group of people, are clear evidence of errors of judgment (with reference to the persons involved) or technical errors of sampling or analysis. No "normal" or average person ever has a concentration of the order of 0.06 or 0.07 in his blood. Such results, therefore, must always be checked for their validity. If this point is belabored, it is because the statement that such fluctuations are often observed is not only incorrect, but represents a complete denial of the thesis on which the differentiation of safety and danger is made. If this were true we should find ourselves in a hopeless situation, with respect to the lead problem.
- Page 10, Par. 2 It is not true that "policemen, parking lot attendants and commuters had higher lead levels than those not so exposed." To the contrary, the differences were statistically insignificant, that is, they

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were of such an order of magnitude as to have occurred by chance alone. Only garage mechanics were definitively higher. The significance of this fact lies in the fact that these men, as a group, unlike the others, are subjected to occupational types of exposure to lead, as painting, body repairs, soldering, that are unrelated to exposure to the exhausts of automobiles. Furthermore, this difference in the part of these men, has been well-known for more than a decade. The fact that these results were within the limits defined as safe is not entirely relevant, although it is not unimportant.

Page 10, Par. 4
Line 1

The statement that "The - - - survey findings 'seemed' to confirm - - - that some of the lead from gasoline engines becomes air-borne" is doubly weak and somewhat defensive. There is no doubt that this survey did confirm previous findings. No one has had any doubt about the fact that lead from automobiles becomes airborne, or that the concentration varies with the time of day, the number of cars operating within a specific area. This is not so much a matter of settling as of diffusion and dispersion by thermal and air-moving factors. It would be desirable to make a straight-forward simple statement to the effect that "- - - the findings confirm those of previous investigations, as to the variations in the concentration of lead in the air of cities under a variety of conditions, including the influence of seasonal and meteorological factors, the density of automobile traffic, and more importantly, for practical purposes, the low order of the average concentration of lead in the general or ambient atmosphere."

Page 11, Par. 2
Latter Half

To this paragraph, which leaves entirely in doubt the matter of respiratory absorption of lead from the air, should be added a somewhat summarizing clause, as follows: "There can be little doubt, however, that some portion of the lead that is discharged into the air from automobiles, is capable both of retention and absorption in the respiratory tracts of persons who are exposed. Present evidence indicates that the total absorption into the body may be of the order of 10 to 15 percent of that which is inhaled."

Page 11, Par. 3

A clause should be added to this one sentence, as follows or of similar import, - "so long as the general level of intake is limited to that derived from the general environment, as represented, at present, by that which occurs in the food and beverages of this country and in the ambient atmosphere."

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