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Statement on behalf of

LEAD INDUSTRIES ASSOCIATION
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by

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Before

SUBCOMMITTEE ON AIR AND WATER POLLUTION
U. S. Senate Committee on Public Works

Thursday, June 9, 1966

My name is Felix Edgar Wormser. I live in Greenwich, Conn. I am a consulting mining engineer with an engineering degree and an honorary doctorate, and I am appearing before you on behalf of the Lead Industries Association. I helped organize the Lead Industries Association in 1928, became its first secretary and ultimately its president. I am also a retired vice president of the St. Joseph Lead Company, a former trustee of Columbia University, a fellow of the American Association for the Advancement of Science, and held the office of Assistant Secretary of the Interior for Mineral Resources during President Eisenhower's first term. Currently I am chairman of the Engineering Council of Columbia University. The credentials I bring to this committee are those of a lifetime involvement with lead and lead problems, including those of public health, as well as an association with many distinguished members of the medical profession specializing in scientific research and lead toxicology.

Your committee, Mr. Chairman, has already done much to stimulate necessary immediate action and equally important continuing research on the problems of safeguarding the air of our cities and countryside. The lead industry's

long time efforts are in accord with your objectives. Our Association and individual companies in our industry have developed and supported extensive effort over the past several decades to understanding the role and control of lead exposures in both industrial and public environments.

The formation of the Lead Industries Association was unique in that it embraced participants from both producers and consumers, that is mining companies, smelting and refining companies, and manufacturers of lead containing products, including lead anti-knock compounds. This remains the structure of the Association today. A central objective of the Association was and is to research lead in all varieties of application and effects and to disseminate to the public the knowledge so gained.

Lead is among the most common metals of the earth's crust and therefore occurs naturally nearly everywhere. It is mined commercially in 18 states. The United States alone uses annually about 1,200,000 tons of lead with a value, at today's prices of $360,000,000. Lead possesses unique physical qualities which make it an effective metal in important social, public safety and utilitarian uses. Among these are radiation shielding from the X-ray room to atomic energy installations, insulating buildings against noises and vibrations, providing packaged power in the form of storage batteries, electric and communication cable shielding, soldering in modern electronic manufacturing, and as an additive to gasoline to give higher performance and greater fuel economy for civilian and military use. Thus, lead is a highly useful metal in our society; it gives employment to thousands of people; and it provides comfort and security to millions in its many applications. For these reasons, a full understanding of any relationship of lead to the health of people working in lead industries and of the general public is essential. Health and safety are matters of paramount importance to us in the lead industry.

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As one of the world's oldest known and used metals, the effects of exposure to lead have been studied for years -- rightfully and necessarily. Lead like so many elements in nature possesses toxic properties. There are few substances, however benign in their general uses, that do not have side effects or toxic effects in some people when misused or abused. The number of cases of serious illness and death that occur in this country each year from the misuse and overuse of ordinary drugs is a good example. With potentially toxic substances, the answer in terms of public health is twofold: one, knowledge gained through research into physiological reaction and response and, two, controls appropriate to the well-being of the populace.

Because of the obvious need to learn everything possible about the manifestation of the toxic properties of lead in its chemical and physical forms from the standpoint of public protection and self-interest, the lead industry in 1925 made a grant to the Harvard Medical School for an exhaustive study of lead's effect on man under the leadership of the renowned Dr. Joseph C. Aub. Absolutely no strings were attached to the grant and the Harvard Medical School was given complete freedom in making its investigation and in making the results public. The sole concern of the industry in these studies was the development of scientific and hygienic truth. Ever since the formation of the Lead Industries Association, the program of medical research has continued and expanded without any change in the basic broad gauge policy initially enunciated -- to seek the truth.

Since 1923 scientists who later formed the staff of Kettering Laboratory of the University of Cincinnati have been engaged in the investigation of various aspects of the occurrence and behavior of lead in the external environment and in the human system. The Association has endorsed this work from the outset. In addition financial and technical support has gone to numerous

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universities for specialized lead research. The Lead Industries Association helps finance the Kettering abstracting service covering articles on lead appearing in the medical and technical publications of the world and distributes these on a quarterly basis. Research projects under the direct auspices of the Lead Industries Association have been relatively few, however, compared with research activities we have stimulated through our "seed" projects and encouragement of efforts by others. Major programs have been undertaken by the Federal government, individual companies in and associated with the lead industry, and by private and public research institutions -- in large part, we believe, because of the initiative taken by our Association.

There is no doubt in my mind that mis-diagnosis and earlier lack of knowledge may have unduly increased public concern about lead. As an officer of the Lead Industries Association I recall investigating personally case after case of press reports alleging lead as the cause of damage where lead was not even used or involved. I wish there were time to relate to you some of my adventures in investigating these cases. Because of my work in this field, I was invited (though my doctorate was not in medicine) to address the Seventh Annual Congress on Industrial Health in Boston in 1946. My position then, as it is today, is that thorough scientific determination be made before lead is cited as a cause of injury or death.

On the subject of lead intoxication in children, it is appropriate that I mention LIA's supported research at the Children's Medical Center in Boston, Harvard Medical School, Johns Hopkins Medical School and the University of Cincinnati. This work has vastly deepened our knowledge and provided guidelines for corrective action. The American Standards Association working with our Association has specified a limit on lead content for interior paints. The manufacturers of children's furniture and toys no longer use lead paints

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in their products. The action of the paint industry, plus the vigilance of public health officials, has achieved great success.

Much early research in lead, of course, was aimed at guarding the health of those whose work in industry involved high exposure to lead. Through the techniques of the industrial hygienist and sound plant engineering, occupational hazards can now be controlled and avoided. Since the goal of the industrial hygienist is prevention much research has gone into the determination of permissible levels of occupational exposure to lead. Continuing studies in industry, correlated with controlled exposure research with human subjects, provide the basis for the widely accepted permissible levels and standards in industry today. These levels and standards are accepted by all state and local governmental agencies having jurisdiction.

Careful research has made it possible to determine safe occupational exposures to lead in the industrial plant air. Furthermore, by measuring the amount of lead in the blood and urine of workers, it is easily possible to avoid exposures that may approach an undesirable level.

From the viewpoint of your Senate Subcommittee, however, the current question concerns the general public. Definitive studies over the years have shown that the average person takes in and eliminates tiny quantities of lead in the food he eats, the water he drinks and the air he breathes. These extensive studies have also shown that in the absence of unusual exposure, human output of lead is the same as the intake. On the average, most of this intake -- about 90 percent -- comes from food and drink and about 10 percent from the air. It is the latter that is most pertinent to these hearings.

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Some lead gets into the air from industrial processing and natural wind disturbances of the earth's surface. Recently attention has been directed toward lead used as a gasoline additive and from which some lead compounds are emitted with auto exhaust.

And here I should mention that lead anti-knock compounds do not influence the formation of photochemical smog. This fact was established in a study at Midwest Research Institute and reported in Industrial and Engineering Chemistry.*

Anti-knock compounds perform a most useful function. In removing "knock" they greatly improve the efficiency of fuel, making possible today's high compression automotive engines. They also conserve a precious natural resource, petroleum, by making gasoline go much further than it would without these additives. Anti-knock compounds have been subjected to exhaustive medical research both here and abroad for over 40 years. One of the earliest of these medical research efforts was performed with the participation of the Federal Government and publication of these early test results was made by the Surgeon General of the U.S.P.H.S. in 1926. This work involved the examination of groups of workers in the gasoline industry and groups of others who were using the new leaded gasoline, and the Surgeon General's expert committee of doctors and scientists reported that there was no hazard to the public in the use of this new product. But the committee cautiously and properly recommended that the question continue to be studied and watched -- and this has been done.

The most recent, and most intensive, of these studies was reported last year by the U.S. Public Health Service and is known as the Survey of Lead in the Atmosphere of Three Urban Communities (PHS Publication No. 999 AP-12). Its findings, based on comprehensive investigations of air-borne lead and

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* April, 1958.

biological sampling of a total of 2,300 people in Los Angeles, Cincinnati, and Philadelphia, again confirm the fact that lead content of the air is low and does not constitute a public health hazard. The report further supports and augments the data compiled by the National Air Sampling Network indicating no increase in lead concentrations in the air of three cities over the last five years. In one city, Cincinnati, the trend in fact has been downward since the late 1940's showing that increased gasoline use does not necessarily result in increased concentration of lead in the air.

This PHS study included a broad scale human sampling program to establish parallel biological data. The biological sample obtained revealed no significant accumulation of lead in people. In addition the United Nations World Health Organization publicly stated last December: "No increase in lead contamination is found by WHO investigation." The WHO study conducted in 16 countries, including the U.S.A., was coordinated by Dr. Leonard J. Goldwater of Columbia University. The study group reported that there has been no increase in lead contamination in the last two decades. Further, WHO said, the results of recent investigations of lead content in the human body and of daily intake through air, food and water do not differ greatly from those shown by older investigations. If there has been any change, the report says, it would appear that at present man is exposed on the whole to less lead in his environment than he was twenty years ago, although greater tonnages are now used in industry and motor fuel additives. Because of these latter uses the report suggests that we not be complacent, and in this we concur as is demonstrated in forward-going studies on lead in the environment.

The amount of research on lead done and published, the significance of this, the interpretation of its meanings to the public, and the contributions made to the lead working industry as well as the general public is so vast

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that I can do no more than indicate here the general results. But all of the facts leading to my generalized statements have been published at length for the whole scientific and medical community to read, study and act upon for greater safety measures. The most serious challenge that I have heard is that continued studies should be made; that we should not be complacent in what we have learned. The need to know in greater detail more about the environmental distribution of lead was brought out quite clearly at the recently held Symposium on Lead sponsored by the United States Public Health Service, Division of Air Pollution, in Washington. And in this we of the lead industry wholeheartedly agree, and we agree by continuing not just our own support of independent research but by encouraging all others to do likewise.

In conclusion I should like to state, more is known about the biological effects of lead than about almost any other air-borne substance. It is one of the most thoroughly investigated areas in the field of air pollution and health. These points are made to support the fact that there is probably no metal about which so much is known in relation to individual and general health. On the basis of this scientific knowledge I can positively assert that lead constitutes no public health hazard in America today. Nevertheless, continued research on lead and its significance to human beings is necessary and desirable and is being carried out. Among research projects, recommended by our medical advisors, in various phases of planning and preparation, is a continuation of the "Three Cities Survey," also a fundamental investigation of the biochemical basis of the function of lead and in particular the mechanism by which it brings about changes; research into bone marrow biopsy as a measure of the total body lead burden and neurophysiological effects from lead exposure.

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Finally I do not think I can do better than bring to your attention the statement published in the Archives of Environmental Health of the American Medical Association in February of this year. In reference to discussions on lead, this statement was made by the Committee on Occupational Toxicology of the Council on Occupational Health of the American Medical Association and concludes as follows: "The Committee feels obliged to point out that as a result of years of careful clinical study in workers in the lead industry significant, subtle, and unrecognized or 'unrecognizable' changes are not occurring in the general population as a result of its exposure to environmental lead. In fact, this vast clinical evidence, evaluated by a great number of clinically trained scientists, suggests that the general public is not now, nor in the immediate future, facing a lead hazard."