BOARD OF DIRECTORS MEETING MINUTES

New York, N. Y. December 6, 1960

A meeting of the Board of Directors of the Lead Industries Association was held on Tuesday, December 6, 1960, in the offices of the Association.

PRESENT	REPRESENTING
Jean Vuillequez, Chairman	American Metal Climax, Inc.
J. S. Bers	Bers & Co., Inc.
W.H.H.Cranmer	New Park Mining Co.
Andrew Fletcher	St. Joseph Lead Co.
K. W. Green	The Electric Storage Battery Co.
F. H. Hurless	International Smelting & Refining Co. (Anaconda Sales Co., Agents)
H. E. Lee	The Bunker Hill Co.
D. A. Merson	National Lead Co.
C. G. Rice	United States Smelting Refining and Mining Co.
J. S. Smart, Jr.	American Smelting and Refining Co.
William Wilke III	Hammond Lead Products, Inc.
M. M. Zoller	The Eagle-Picher Co.

OTHERS PRESENT

C. R. Ince	St. Joseph Lead Co.
W. J. Welch	National Lead Co.

Robert L. Ziegfeld, Secretary-Treasurer
David M. Borcina, Assistant to Secretary
Schrade F. Radtke, Director of Research
Samuel E. Eck, Research Engineer
A. R. Cook, Research Engineer

The meeting was called to order at 2:40 PM with Mr. Vuillequez in the chair.

The minutes of the previous meeting of April 6, 1960, were approved.

The chairman called on the research director for his report.

REPORT OF RESEARCH DIRECTOR

The research director presented his report as per Exhibit "A." (Sent to Board members on November 30, 1960.)

A question was raised as to what value the research project on "Lead in Cyclic Conditions" would have in increasing the uses of lead.

The research director replied that this project should be considered as fundamental and if successfully concluded could lead the way to increased efficiency in storage batteries. Also because it is fundamental in nature, the results may help to develop or increase the use of lead in other markets.

A question was then raised as to the results of the research project on lead as an antivibration material.

The research director replied that this project had been concluded and that the report of the contractor, Lessells and Associates, indicated that the lead-encased pads provided very little, if any, vibration attenuation. He stated that he believed the results to be accurate and that the end of the road had been reached.

The research director then explained the need for an Undesignated Research Fund of $50,000 to have available funds for any research needs that may become necessary during the year, citing that an insufficient reserve for such purposes in the past had made it necessary to cut back on certain research projects. This premise was questioned and the research director stated that he would review his records and provide the members with confirming data.

There being no further discussion, a motion was made, seconded and unanimously approved that the recommended 1961 budget of $341,875, which includes $265,000 for research and $76,875 for administration, at the estimated rate per ton of 26 cents, be adopted. The research director left at this point to catch a plane.

The chairman then called on the secretary-treasurer for his report.

1961 BUDGETS

At the request of the chairman, the secretary distributed copies of a Recapitulation of LIA Budget Data (Estimated), as per Exhibit "B" attached.

The secretary then presented his recommended 1961 budgets for the Ordinary, Pension, and Health and Safety Funds, and the Industry Development Fund, as per Exhibit "C." (Sent to the Board members on November 25, 1960, attached to the agenda.)

Ordinary, Pension, and Health and Safety Funds

The Health and Safety work of the Association was discussed and it was generally agreed that it should be a full-time position on the part of at least one man. The secretary stated that he was in full agreement and that there were two alternatives:

1. Employ a young industrial hygienist, or
2. Employ a man with an established national reputation.

It was then suggested that the secretary investigate the various possibilities and report his findings to the Executive Committee. The president said there is some question as to whether research on health and safety should be under LIA or ERP.

The secretary then reported that his recommended 1961 budget for the Ordinary Fund is $63,400, for Health and Safety $15,450, a total of $78,850. The estimated 1961 rates per ton required to yield this sum would be as follows:

Classification	Estimated 1961 Rates per Ton
Mining	12 cents
Smelting and Refining	3 cents
Manufacturing	3 cents
Assembled Articles	1.5 cents

A motion was then made, seconded and unanimously approved that the 1961 recommended budgets for the Ordinary, Health and Safety, and Pension Funds, and the estimated rates per ton be adopted.

Industry Development Fund

The secretary pointed out that the recommended 1961 budget of $290,500 is only slightly higher than in 1960, accounted for primarily by the transfer of Pension and Group Insurance charges from the Ordinary to the Industry Development Fund. Also, salaries are substantially larger, but more than half of this is accounted for by the proposal to discontinue placing publicity through an outside agency and to handle it, he believed more effectively, by an addition to the staff.

The secretary further stated that he is including in the recommended 1961 budget an expenditure of $5,000 to develop the basic data included in the research report on lead-asbestos antivibration pads prepared by Lessells and Associates and for publication of useful information that can be developed from the report. Although the report of the research contractors was negative, concurred in by the Expanded Research Program, the secretary stated that as a result of a preliminary evaluation of the report by engineers on his staff, which has not been fully completed, a rather extensive market for these pads was indicated. The secretary also said he contemplated discussing, at small expense, the value of such pads with competent outside consultants in cooperation with the director of research.

The secretary then stated that the recommended 1961 budget for the Industry Development Fund was $290,500, which would require an estimated rate per ton of 52 cents based on an estimated 510,000 tons of pig lead sold in the United States.

A motion was thereupon made, seconded and unanimously approved that the recommended 1961 budget for the Industry Development Fund and the estimated rate per ton be adopted.

1961 APPROVED BUDGETS

The approved 1961 budgets for the Ordinary, Health and Safety, Industry Development, and Expanded Research Funds are attached in detail as Exhibit "D," and a recapitulation follows:

Recapitulation of 1961 Approved Budgets

	To Be Subscribed	Approved Budget
Ordinary Fund	$ 63,400	$ 63,400
Health and Safety Fund	15,450	15,450
Industry Development Fund	263,500	290,500
Research Fund	341,875	421,875
Total	$684,225	$791,225

INCORPORATION OF THE ASSOCIATION

Incorporation of the Association was then discussed and, upon motion duly made and seconded, the following resolutions were unanimously adopted:

RESOLVED, that incorporation of the Association pursuant to the provisions of the New York Membership Corporations Law is in the best interests of the Association and its members;

FURTHER RESOLVED, that the forms of Certificate of Incorporation and By-Laws (drafts dated November 22, 1960) providing for such incorporation, submitted to this meeting, be and they hereby are approved;

FURTHER RESOLVED, that an Incorporation Committee composed of five members, Messrs. Thomas T. Richmond, Barry R. Bryan, D. Broward Craig, Thomas Ewing III and Philip S. Winterer, each with power of substitution, be and it hereby is established, and that such Incorporation Committee be and it hereby is authorized and directed to file all such documents and to take all such other action as the majority of its members deem necessary or advisable to incorporate the Association as a New York membership corporation under the name "Lead Industries Association, Inc." with a Certificate of Incorporation and By-Laws substantially in the forms submitted to and approved by this meeting, subject to prior approval by the members and associate members of the Association;

FURTHER RESOLVED, that the form of Consent for use by the members and associate members of the Association in approving such incorporation and related transactions, submitted to this meeting, be and it hereby is approved, and that the appropriate officers of the Association be and each of them hereby is authorized and directed to mail to each member and associate member of the Association such form of Consent, together with the forms of Certificate of Incorporation and By-Laws submitted to and approved by this meeting, with such changes therein as may be approved by the Incorporation Committee;

FURTHER RESOLVED, that the officers of the Association elected at the meeting of the Board of Directors of the Association on April 6, 1960, be and they hereby are authorized and directed, upon incorporation of the new membership corporation, to serve as the officers of the new membership corporation in their present respective capacities until the first annual meeting of the Board of Directors of the new membership corporation and until their successors shall have been elected and shall have qualified; and

FURTHER RESOLVED, that the members of the Executive Committee of the Association elected at the meeting of the Board of Directors of the Association on April 6, 1960 be and they hereby are authorized and directed, upon incorporation of the new membership corporation, to serve as members of the Executive Committee of the new membership corporation until the first annual meeting of the Board of Directors of the new membership corporation and until their successors shall have been elected and shall have qualified.

REGISTRATION FEES AT ANNUAL MEETING

The secretary reported that the committee appointed at the last meeting to investigate increased registration fees at the Annual Meeting, Messrs. Vuillequez, Ziegfeld, Kenly and Kimberley, recommended maintaining the present registration fees.

REPORT ON TOXICOLOGICAL RESEARCH

The chairman of the Committee on Toxicological Research, Mr. W. P. Wilke III, reported on the results of their meeting last July. He stated that the committee agreed unanimously that lead toxicological research should be undertaken and that a permanent subcommittee of qualified medical, toxicological and industrial hygiene personnel be appointed to determine the specific nature of such a program and what lead compounds need to be studied, and to supervise the operation of such a program.

Mr. Wilke stated that he had discussed the formation of such a subcommittee with the secretary and that they are faced with two obstacles that are difficult to overcome. One is the lack of qualified medical and toxicological personnel in the employ of our members. The other is the difficulty of getting qualified outside personnel to serve on the committee since, except in the case of consultants who would have to be paid, most of the qualified people are permanent employees of other companies.

After some discussion, the Board agreed unanimously that action on the appointment of a subcommittee to guide any toxicological research that may be undertaken by the Association be deferred until a new Director of Health and Safety is appointed.

NOMINATING COMMITTEE FOR OFFICERS

With the approval of the Board, the chairman appointed the following members of the Board to serve as a nominating committee for officers of the Association:

Harold E. Lee, Chairman, The Bunker Hill Co.
J. S. Bers, Bers and Co.
William Wilke III, Hammond Lead Products, Inc.

NOMINATING COMMITTEE FOR MEMBERS OF THE BOARD

With the approval of the Board, the chairman appointed the following representatives of member companies to serve as a nominating committee for members of the Board of Directors of the Association:

W. B. Clancy, Chairman, American Smelting and Refining Co.
Harvey Ferer, Aaron Ferer & Sons Co.
J. J. Forst, Olin Mathieson Chemical Corp.
L. J. Randall, Hecla Mining Co.
R. J. Searls, Newmont Mining Co.

MEMBERSHIP RESIGNATION

The secretary reported that he had received a letter of resignation from Glaser Lead Co., 31 Wyckoff Ave., Brooklyn 27, N. Y.

A motion was made, seconded and unanimously approved that Glaser Lead Company's resignation be accepted with regret.

BROADENING THE SUPPORT OF THE EXPANDED RESEARCH PROGRAM

The chairman reported that the Executive Committee of the Expanded Research Program at its meeting of November 28 had recommended that an attempt be made to broaden the support of the Expanded Research Program by including foreign producers who are not at present cooperating in this program. They therefore urged the members of the Board to discuss membership in the Expanded Research Program with those companies not now cooperating in the program. The chairman then requested the secretary to send to members of the Board a list of those companies now supporting the Expanded Research Program.

RESOLUTIONS OF APPRECIATION

The secretary reported that, as directed at the last meeting, he had sent Resolutions of Appreciation to Messrs. Mulock and Wormser. The resolutions and letters of acknowledgment from Messrs. Mulock and Wormser are attached as Exhibit "E."

INDUSTRY DEVELOPMENT COMMITTEE RECOMMENDATION ON EXPANDED RESEARCH PROGRAM'S FINANCES

The secretary reported that the Industry Development Committee at its meeting of November 30, 1960, had unanimously recommended to the Board of Directors that the rules regarding the financing of research projects in the Expanded Research Program which would in effect tie up large amounts of money for the year unnecessarily, be reconsidered.

After some discussion, it was agreed that the Executive Committee review the cash position of the Expanded Research Program from time to time as reported to it by the treasurer.

SECONDARY LEAD STATISTICS

Mr. Green then discussed available lead statistics and pointed out that the lack of good secondary statistics is a major weakness in the entire lead statistical picture and that an attempt to remedy this should be made.

The Board was in general agreement. However, no decision was made as to the method of approach in attempting to secure such statistical data.

STAFF SALARIES

Staff salaries were next considered. It was explained that only the highest two or three salaries required Board approval according to precedent set over the years, other salaries being adjusted by the secretary with the approval of the president, after comparisons with member company and AZI salaries. These adjustments had already been reviewed, leaving only the salaries of the secretary-treasurer and his assistant, Mr. Borcina, to be reviewed by the Board. An increase recommended for Mr. Borcina was approved, and the Board granted a four per cent increase for the secretary-treasurer.

There being no further business, the meeting adjourned at 5:15 PM.

Secretary

RLZ:JRH

Att.

Board of Directors Meeting Minutes

December 6, 1960

AZI-LIA EXPANDED RESEARCH PROGRAM

AMERICAN ZINC. INSTITUTE, INC.

LEAD INDUSTRIES ASSOCIATION

292 MADISON AVENUE
NEW YORK 17, N. Y.
OR 9-6020

SCHRADE F. RADTKE
Director of Research

November 30, 1960

To All Members of the Board of Directors of the
Lead Industries Association

Gentlemen:

Attached is a copy of the information on the 1961 Expanded Research Program budget which was submitted to the Industry Development Committee for their review. At their budget meeting on 30 November, the budget, as presented in the appended memo, was approved in toto. Because of the limited time we have available, we are sending you the financial statement as well as the budget recommendations which were submitted to and approved by the Industry Development Committee, in order that we might have this information in your hands as promptly as possible. We trust that you will have an opportunity to review this prior to our Board of Directors Meeting on 6 December, 1960.

Very truly yours,

Schrade F. Radtke

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attachment

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AZI-LIA EXPANDED RESEARCH PROGRAM

AMERICAN ZINC. INSTITUTE, INC.

LEAD INDUSTRIES ASSOCIATION

292 MADISON AVENUE
NEW YORK 17, N. Y.
OR 9-6020

SCHRADE F. RADTKE
Director of Research

November 22, 1960

TO ALL MEMBERS OF THE INDUSTRY DEVELOPMENT COMMITTEE OF THE LEAD INDUSTRIES ASSOCIATION

Gentleman:

Our research program for 1960 has seen a number of significant advances. While not every project has been as successful as we would have wished, nevertheless the majority of our programs are moving ahead and producing important developments for our industry. It is interesting to note that our program on the development of improved cable sheathing techniques conducted in conjunction with the John F. Robertson Company has produced many significant results during 1960. One company purchased the original Robertson machine and another company has been able to utilize a previous model of the Robertson machine to extrude the high strength tellurium alloy. Other organizations in England and on the Continent are modifying their own equipment to extrude the same range of alloys which were successfully produced by the Robertson machine. In October a paper covering this development was presented at the Fall Meeting of the American Institute of Electrical Engineers and reprints of this paper are being widely distributed. There has been a great deal of interest generated throughout the world in this development, and it is believed that our research has contributed greatly to the stimulation of research in lead cable sheathing. It will be some years before its effect will be fully realized; nevertheless, this development is of major significance.

Among other important developments is the paper which has been reeently reproduced by the LIA covering the study of the potential of lead for sound attenuation carried on by Bolt Beranek and Newman. From this study a program has been developed and a contract has been let recently to carry on the investigation of lead application to the field of sound attenuation; the fundamental investigation of lead powder metallurgy has yielded alloys with very superior physical properties and creep strength. The copper-lead system shows a great deal of promise; the study of fiber-reinforced lead is yielding material with good physical properties and outstanding creep resistance; the ceramic fellowships will yield approximately seven technical papers during the present year; the development of a primer paint incorporating lead compounds in water soluble vehicles is showing considerable promise; and research on the utilization of lead chemicals indicates the possibility of application of existing materials to jet fuel for minimizing mold formation and subsequent damage to engine filters and pumps causing malfunctioning during flight. On the other hand,

our work on vibration attenuation utilizing the lead-asbestos pad has not produced the desired results for application in the machinery field. Despite this fact the lead-asbestos pad for architectural application is the only material known which has such outstanding life and is capable of extremely high bearing loads without failure. While attenuation or vibration is of marginal value, nevertheless there does not appear to be an alternate capable of meeting this requirement.

Our proposed program for 1961 is of the order of $265,000. While this sum is below that of the 1960 program, we have attempted to economize in every possible place to save money and at the same time we do not feel that this in any way will hamper the progress of our research for new lead applications. It is believed that all projects recommended for investigation in 1961 as well as the continuation of existing research is essential to the progress of expansion and retention of lead markets and therefore no alternate priority has been suggested. It is strongly urged that the program as recommended be accepted.

ELECTROCHEMICAL RESEARCH

Proposed research in this area covers applications of lead where its outstanding corrosion resistance is required and where we are utilizing electrochemical disciplines to study the behavior of batteries, methods for high-speed plating of lead to produce lead-clad substrates for containers as well as architectural applications and chemical methods for lead plating. A similar process is the Chem-Nickel process for plating nickel on steel and other metallic substrates which has outstanding throwing power. If an equivalent process could be developed for lead, it would have important technical as well as market applications. Another problem which has been encountered for which a study has been recommended is the corrosion of lead-lined tanks for electroplating. It is believed that by combining a technical study in conjunction with our member companies followed by a technical investigation for unresolved areas could help the utilization of lead-lined tanks for plating applications.

1. LP-36-61 - High Speed Plating of Lead. It is acknowledged that the container industry and the architectural field represent markets of important potential for those materials which can provide the necessary corrosion protection at a competitive price.

The container industry has never been completely satisfied with tin plate for can production, particularly for non-food applications. On the outside of the can the tin layer actually promotes unsightly and destructive pitting corrosion of the basis steel, although on the inside of the can the lack of oxygen causes the tin to give galvanic protection to the steel to supplement the effect of the organic coating which is usually present.

A lead plated steel sheet having a very thin lead layer could find important application for non-food containers and of particular significance to us is the interest being shown by the American Can Company. It is proposed that preliminary corrosion tests would allow an early judgment to be formed as to whether development of the necessary high speed plating process will be economically justified for this application. It is not proposed to proceed with the main part of the program unless a positive indication is received from these tests.

A thicker layer of lead would be required for architectural purposes, and in view of the large potential, it is felt that the suggested program will allow necessary consideration of this field as well.

2. Chemical Reduction Plating. This is a technique which has led to wide applications for other metals such as nickel. Experience with chemical reduction coatings in general indicates that a successful lead coating would be pore-free and, therefore, may be especially desirable in particular applications where complex surfaces are to be plated. Similar nickel baths have outstanding throwing power.

At the present time there is no specific application in sight, but it is felt development of a successful process would bring important applications such as deposition on plastics for sound attenuation, and chemical tank linings.

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3. Electrochemical Corrosion of Plating Equipment. It has been noted that lead-lined electroplating tanks can fail in a very short time if the current which normally flows directly from the anode to the work can find an easier path by flowing from the anode to the tank, and subsequently to the work from another point in the tank lining.

The lead lining is likely to corrode where it becomes cathodic in such a circuit. This may be an important consideration in the decision to use lead tanks for these applications, and this general principle comes into play in the electrochemical corrosion of lead cable sheathing as well. In conjunction with the LIA staff, the industry is to be canvassed to establish recommended design and engineering considerations for construction of such plating tanks. Where data are lacking, research will be undertaken to close these gaps, so that ultimately a design manual for lead-lined electroplating baths can be developed. The recommended fund is believed ample for the development of the necessary data.

CHEMICAL RESEARCH

It is planned to continue fundamental study as well as an applied investigation of lead chemicals. While at the present time there does not seem to be any major attack upon the future market for lead tetraethyl, the potential development of gas turbines and expansion of the use of jet engines, will all contribute toward reducing the consumption of tetraethyl lead in the future. Should the day develop when this market is challenged seriously, we feel it is imperative that our research on the development of new lead chemicals for a myriad of applications be ready to sustain any potential loss in the anti-knock field. As mentioned in previous paragraphs our research in ceramics through our fellowship program has produced a great deal of interest; graduates of our program are joining commercial organizations to continue their studies on industrial uses of lead in ceramics. We are continuing our investigation of lead chemicals for metallic primers for water-base paints.

We are planning to eliminate one program from our investigation but at the same time plan to continue our investigation through other contractors covered in this area.

1. LP-18-61 - Lead Organic Compounds. We plan to increase the rate of effort at T.N.O. to a $25,000 level during 1961. $20,000 remains from our 1960 budget and an additional $5,000 will be required to bring this up to the $25,000 level. Chemicals developed out of this investigation are being evaluated for potential application in insecticides, etc. at T.N.O. This research was initiated early in 1960, but is now well under way, and it is believed that this study at T.N.O. is well deserving of expansion.

2. LP-28-61 - Organolead Chemistry. Because of injury to the scientist who was to initiate our investigation at the Quartermaster Research Laboratories in Natick, Massachusetts, it will not be necessary to appropriate new funds for this study. Not only will the investigator conduct research on new lead chemicals, but it will also be possible to have these chemicals evaluated in the extensive applications laboratories of the Quartermaster Corps. Such areas will be in insecticides, mildicides, fuel additives, chemical additives for mildicides in clothing as well as in paints and other protective coatings. It is contemplated that this research will start soon after the first of the year.

3. LP-10-61 - Lead Chemicals. It has been recommended by the ERP staff as well as the Chemical Subcommittee and the Technical Steering Committee to cancel our contract at Arthur D. Little. It was felt that the progress of effort at Arthur D. Little was not commensurate with the expenditure of funds. Some significant results were obtained, particularly the utilization of lead chemicals for minimization of mold formation in jet fuels. Although this contract is to be cancelled, the Committee felt that it was imperative that we set aside an additional $10,000 to be earmarked specifically for the evaluation of lead chemicals. Based upon an investigation of the two contractors, that is the Quartermaster Research Laboratories in Natick and/or T.N.O. in Holland, that negotiations be made with one of the two organizations to add an additional $10,000 to their contract to insure full evaluation of existing lead chemicals as well as the lead chemicals coming out of the research investigation under way. This area is of such significance that it was felt that we should expend the additional sums for this evaluation.

4. LP-34-61 - Anticorrosive Properties of Lead Pigments and Compounds in Water Reducible Ferrous Metal Primers. There can be no question as to the importance of a successful outcome to this investigation. Water emulsion paints have many noteworthy advantages over more conventional paints. The automobile industry, for instance, would welcome elimination of the volatile vehicle with its consequent fire and toxicity hazards. The potential market has been estimated as being of the order of 10 million gallons per year.

All committees involved have been particularly pleased with the progress made at this early stage of the investigation and this program is regarded as being of particular importance.

5. Lead in Ceramics Materials - Fellowship Programs - It is felt that the ceramics fellowship programs are making an excellent contribution to the over-all subject of the use of lead oxide and other lead compounds in the ceramics industry. In the 1960-1961 academic year there are ten programs under way on a wide range of subjects from the study of glazes and enamels to dielectric and ferroelectric ceramics. It is felt that the expenditure on these fellowship programs is well justified because of the fundamental information they have added to lead ceramic technology and the stimulation of interest in a ceramics industry attributable to application of the work. Many papers have been presented before the American Ceramics Society on work carried out on LIA fellowships which were subsequently published in this organization's journal. It is anticipated that six to eight additional papers will be published in the 1960-1961 academic year which will add further stimulation to the consideration of lead in ceramics materials. Much fundamental data have come from these programs on phase relationships and physical properties, electronics behavior and fundamental behavior in glazes and enamels. In these programs we are obtaining the direction and supervision of eminent ceramics professors at various universities and indirectly given first hand information on what lead chemicals can do in ceramic systems. In addition, we are training young advanced degree students on the merits of lead in ceramics. Although it is difficult to assess the value of exposure of eminent professors and students to lead technology, we have made in the various publications arising from the program and in the additional technical information a direct contribution to our industry.

At the end of the present academic year three of the ten programs now in progress will be terminated and more emphasis will be placed on the use of lead in glazes and enamels by the addition of two programs in these areas. Glazes and enamels now constitute a growing market for lead compounds, and it is felt that additional emphasis should be placed in this general field. The titles of the programs and the universities at which they will be carried out are delineated below to indicate the scope of the recommended 1962 program. To continue this program in the 1961-1962 academic year, which we highly recommend, the sum of $30,000 will be required.

a. LP-12-61 - Wettability of Lead Glazes Upon Structural Clay Bodies, Clemson Agricultural College.
Continuation Recommended - $ 2,500

b. LP-14-61 - Phase Relationship and Physical Properties of Selected Ceramics Systems, Pennsylvania State University.
Continuation Recommended - 3,870

c. LP-19-61 - Low Temperature Lead Enamels Containing Molybdenum and Bismuth Oxides - University of Illinois
Continuation Recommended - $ 3,000

d. LP-21-61 - Development of Ultra Low-loss Ceramic Dielectrics, Rutgers, the State University.
Continuation Recommended - 3,000

e. LP-22-61 - Fundamental Behavior of Lead in Glasses, Alfred University.
Continuation Recommended - 3,000

f. LP-23-61 - Study of Ferroelectrics Contining Lead Compounds, University of California Continuation Recommended - 3,000

g. LP-37-61 - Polymorphs of Lead Oxide, Pennsylvania State University. Continuation Recommended - 3,870

Sub-total $22,240

h. Recommendation of funds to initiate two additional fellowships, with particular reference to glazes and enamels 7,760

TOTAL $30,000

6. Lead in Paints. Because of the increasing trend toward the use of water reducible vehicles for exterior house paints, it is believed that research should be initiated in 1961 to determine the compatability of lead pigments with these vehicles, their storage stability, weathering characteristics, and over-all service for exterior applications. It is believed this research is necessary and should be initiated on a fellowship basis rather than initiate an intensive program at this time.

For this investigation a sum of $10,000 has been requested.

METALLURGICAL RESEARCH

As mentioned in preceding paragraphs significant progress has been made in our metallurgical research to develop improved lead alloys and to minimize inherent defects in lead alloy systems. During the year it was found that in our study of lead-based alloys, oxygen was a very significant additive and could vary physical properties on ultra high purity lead significantly. Despite this, progress has been made and it is felt that this research should continue during the coming year. Research in powder metallurgy is producing significant results and high-strength, creep resistant alloys have been developed. A contract has been let for the utilization of lead in sound attenuation. It is believed that additional sums should be provided to continue the present contract through 1961. Of all the research we have under way, the area where the greatest potential lies is the utilization of lead for sound attenuation in architectural and related applications. Pilot samples of lead coated steel produced by vacuum metallization are available and are now being evaluated for container stock. It is believed that alternate processes such as direct cladding of powder on steel should be initiated to insure that the lead clad steel market is regained. No new funds are required, and it is believed that the existing funds set aside in previous years should be devoted to these investigations. Fundamental study of the dynamic behavior of lead surfaces should be continued and again funds have been set aside in previous years. Because of the development of new techniques for joining materials by adhesives, cold welding, ultrasonic welding and the like, it is believed that a program in this area should be initiated. Significant properties have been developed by our powder metallurgy studies and it is contemplated that extruded pipe samples and sheet samples be produced to determine the capability of scale up of this process and the behavior of full-scale products. It is also believed that metallic lead as a lubricant be investigated to expand this market. Our metallurgical research program is broad and yet it deals directly with inherent characteristics of lead which are in some cases a deterrent to its usage and in other cases the very basis for its potential usage.

1. LP-4-61 - A Study of Lead-Base Alloys. This is a fundamental research program to shed light on the intrinsic properties of lead and lead-base alloys to yield information for the eventual scientific development of new lead alloys possessing superior characteristics. In the program only the highest purity materials are being used to prepare alloys for the study of recrystallization, solute hardening, two-phase hardening characteristics of binary and more complex lead systems. The fundamental data are needed for the design of new alloys systems as well as to explain past phenomena which have been observed but not adequately understood. The very important role that oxygen plays on the properties of lead alloys, information which was not previously available, is coming to light.

Although a wealth of technical information on lead-base alloys has already arisen from this program, it is felt that additional basic information is required which can be translated into development of additional useful alloys. Specifically more work needs to be done on ternary and more complex systems as well as delineating more thoroughly the role oxygen plays in lead systems. It is believed that for the intermediate period, as well as in the future, this work will be of great value to the industry. Continuation at the rate of $28,500 is therefore recommended.

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2. LP-8-61 - Fundamental Investigation of Lead Powder Metallurgy. This program was initiated to develop the fundamental knowledge necessary to

produce dispersions strengthened lead alloys by the powder metallurgy process. Through this approach it was anticipated that alloy systems could be developed with superior mechanical and creep properties which could not be obtained through the normal process of casting an ingot and converting it to wrought materials either by rolling or extrusion. The results of the program have shown that indeed the powder metallurgy process can produce superior properties. Lead-copper alloys which have been studied have shown ultimate tensile strength in excess of 8000 psi and creep strengths ten times as great as for alloys produced in a conventional manner. Much additional work needs to be done to thoroughly evaluate the potential of the powder metallurgy approach. It is felt that many new alloy systems are possible which will yield properties equal to or in excess of those of the lead-copper alloy. In view of the fact that the low strength and creep resistance of lead alloys has inhibited its use in many applications, it is felt that the industry must pursue this area further. For this an additional sum of $16,000 is recommended to extend the present program for an additional year.

3. LP-16-61 - Lead for Sound Attenuation. It is felt that the use of lead for sound attenuation is a market area which holds great promise for increased usage of lead. Although lead has been ignored in architecture and related fields for its sound attenuating properties in the past, it is interesting to note that architects and engineers are becoming aware of its superior merits. They are suddenly realizing the virtues of lead as a sound attenuating material and it is felt that this is a healthy environment to the eventual acceptance of the work we are beginning. Lead impregnated polyvinyl chloride is finding its way into folding doors. Lead wire is finding its way into woven type fabrics for this same purpose. Various naval research laboratories are working seriously on the use of lead and leaded materials to attenuate sound and vibration in ships' hulls. It is being used for damping and transmission loss purposes in office equipment and jet aircraft. The recently distributed Bolt Beranek and Newman report on the use of lead for sound attenuation has created additional interest.

A program is now in progress at the firm of Lewis S. Goodfriend & Associates to do research consisting of design, fabrication and evaluation of typical structures and components for many architectural applications. From this work it is hoped that we can make firm technical recommendations for the most effective and economic methods of incorporating high transmission loss architectural components employing lead, such as movable partitions, folding doors, acoustical drapes and wallpaper, machinery enclosures, etc.

Due to the broad scope of the research it is not felt that the research can be concluded on a one year's program. In view of the fact that the 1960 program is being initiated late in the year, it is requested that only $10,000 be set aside in the 1961 budget to extend this program to the end of 1961 at which time a further extension can be considered in the 1962 budget.

4. Joining of Lead to Lead and Other Substrates - Lead and lead products have long been used in the chemical industry and the plating industry as a lining to impart corrosion resistance. A more recent period has seen its increased incorporation in mobile structures as a lining for nuclear shielding. It has been reported that the market for lead for these uses has been relatively static in recent years and considerable blame for this condition has been related to the fact that there is no cheap method for joining lead into suitable structures. At present lead burning is the principal method used and the cost is often prohibitive which gives economic weight to the use of other materials in place of lead. It has been indicated that the base price of the lead products is multiplied many times when the lead

is finally in place due to the high labor costs and slowness of lead burning. While the suitability of lead for its corrosion resistance and nuclear properties in these areas is unquestioned, the problem of joining in many cases has made it uneconomic and substitutuc materials arc considered. It is felt that more economic methods are found for joining lead to itself and to other substrates, this would insure its increased utilization. One avenue of approach to this problem that has been suggested is the use of adhesives for the bonding of lead. In recent years great progress has been made in the adhesive industry to meet high strength and temperature requirements, and if these materials are suitable in the corrosion and nuclear environments where lead is desirable their use in conjunction with lead may be one solution to the economic problem. In other applications cold bonding of lead as well as lead spraying may prove more economical methods of incorporating it in structures. The bonding of lead to other substrates is also going to be encountered in the utilization of lead composite materials for sound attenuation.

It is recommended that a program be initiated to develop more economic methods for joining lead because of the effect this may have on increased utilization where its properties are desired for corrosion resistance, nuclear shielding, and sound attenuation. It is felt that the recommendation of $25,000 is well justified for this research effort.

5. Pilot Plant Production of Lead Powder Metallurgy Sheet and Extrusions. Due to the success of the lead powder metallurgy program at Rensselaer where alloys have been developed with improved strength and much improved creep properties through the powder metallurgy technique, it is felt that one step further should be taken to translate this basic technology into usable products such as sheet, extrusions, and cable sheathing. From a technical standpoint, it was felt that sufficient progress had been made to show the merit of the powder metallurgy process from a fundamental standpoint and that therefore preliminary studies should be made to determine how this technological break through can be utilized in the manufacture of products. The objectives of this research would be to determine the best methods of fabricating lead powders into sheet, extrusions, and cable sheathing, to determine if the outstanding properties obtained in the laboratory can be obtained by pseudo-production techniques, and to determine if more economic particulant materials other than the fine powders used in the laboratory can produce these outstanding increases in properties. It is also felt that by the limited experiments contemplated, the relative economics of the process can be determined.

Technically the powder metallurgy approach to producing superior lead alloys appears very promising for the industry, but to hasten the use of this technique, it is necessary to perform this additional work in process metallurgy. It is recommended that $20,000 be allocated in the 1961 budget to initiate this work.

6. Metallic Lead as a Lubricant. Metallic lead has a unique property as a solid lubricant in that its static coefficient of friction with steel is essentially equal to the dynamic coefficient of friction. In frictional applications where chatter or noise and vibration result from a stick-slip phenomenon caused by the alternate starting and stopping action of the two surfaces passing over each other, lead could prove beneficial in that this effect in the attendant noise and vibration could be eliminated. The use of metallic lead powder as a lubricant in municipal transit systems to mitigate wheel noise developed from rail transit cars in braking and in turns has been recommended because it was felt that its unique frictional properties would eliminate stick-slip vibration. Although the lubricating properties of lead have long been known and is the basis for their use in bearings for many years, it is not felt that this unique property of lead with regard to

its equal static and dynamic coefficient of friction has been pursued in its own right for the development of additional uses of lead. It is felt that there might be other areas where this particular property of lead may be used to advantage, and to investigate this possibility it is recommended that $5000 be budgeted to develop further information with regard to these properties and their potential application.

CONCLUSION

In conclusion, the ERP Staff and the technical committees have endeavored to maintain a broad and inclusive program in lead research. Nevertheless where areas had been unproductive or where there have been delays in establishing firm contracts, no new funds have been requested. Despite the over-all reduction in dollars it is nevertheless felt that the budget proposed will cover the significant areas in which lead has important potential application. Our fundamental research effort is also continuing unabated, and it is believed that this should be supported as firmly as the applied research program.

Schrade F. Radtke

1961 BUDGET RECAPITULATION

Project No.	Title	Contract Price	Funds Available 1960	Funds Required 1961
	ELECTROCHEMICAL SUBCOMMITTEE			
LP-35-61	Fundamental Study of the Electrochemical Behavior of Lead in Various Media Including Cyclic Conditions.	$ 10,000	$ 10,000	$ -
LP-36-61	High Speed Plating of Lead.	25,000	10,000	15,000
	Chemical Reduction Plating.	10,000	-	10,000
	Electrochemical Corrosion of lead in Plating Equipment.	5,000	-	5,000
LP-38-61	Corrosion Research Council.	500	-	500
	Electrochemical Subcommittee-Subtotal	$ 50,500	$ 20,000	$ 30,500
	CHEMICAL SUBCOMMITTEE			
LP-18-61	Fundamental Study of Lead Organic Compounds.	25,000	20,000	5,000
LP-28-61	Organolead Chemistry.	10,000	10,000	-
	Evaluation of Lead Chemicals.	10,000	-	10,000
LP-34-61	Development of a Primer Paint Incorporating Lead Compounds and Water Soluble Vehicles.	25,000	-	25,000
	Lead Fellowship Program			
LP-12-61	Wettability of Lead Glazes Upon Structural Clay Bodies.	2,500	-	2,500
LP-14-61	Phase Relationship and Physical Properties of Selected Ceramics Systems.	3,870	-	3,870
LP-19-61	Low Temperature Lead Enamels Containing Molybdenum and Bismuth Oxides.	3,000	-	3,000
LP-21-61	Development of Ultra Low-Loss Ceramic Dielectrics.	3,000	-	3,000
LP-22-61	Fundamental Behavior of Lead in Glasses.	3,000	-	3,000
LP-23-61	Study of Ferroelectrics Containing Lead Compounds.	3,000	-	3,000

Project No.	Title	Contract Price	Funds Available 1960	Funds Required 1961
LP-37-61	Polymorphs of Lead Oxide.	$ 3,870	$ -	$ 3,870
	Recommendation of Funds to Initiate two additional fellowships with particular reference to Glazes and Enamels.	7,760	-	7,760
	Lead in Paints.	10,000	-	10,000
LP-29-61	Fundamental Study of Surface Reactions on Lead.	4,000	4,000	-
	Chemical Subcommittee - Subtotal	$114,000	$34,000	$ 80,000
	METALLURGICAL SUBCOMMITTEE			
LP-4-61	A Study of Lead Base Alloys.	28,500	-	28,500
LP-8-61	Fundamental Investigation of the Powder Metallurgy Process for Producing Lead Alloys.	16,000	-	16,000
LP-16-61	Lead for Sound Attenuation in Architecture.	10,000	-	10,000
LP-26-61	Lead Coated Steel Can Stock.	18,000	18,000	-
LP-31-61	Influence of Alloying Elements on Fatigue Resistance of Lead in Various Atmospheres.	8,000	8,000	-
	Joining of Lead to Lead and Other Substrates.	25,000	-	25,000
	Pilot Plant Production of Lead Powder Metallurgy Sheet and Extrusions.	20,000	-	20,000
	Metallic Lead as a Lubricant.	5,000	-	5,000
	Metallurgical Subcommittee - Subtotal	$130,500	$26,000	$104,500

Electrochemical Subcommittee	$ 30,500		
Chemical Subcommittee	80,000		
Metallurgical Subcommittee	104,500		
Subtotal		$215,000	-
Undesignated Research Funds		50,000	
GRAND TOTAL		$265,000	

LIAC0711

LIA-EXPANDED RESEARCH PROGRAM
BUDGET PERFORMANCE

Nover

	I 1959 Budget Performance (as of 12/31/60)	II 1960 Budget Performance (As of 12/31/60)	III 1961 Proposed Budget
A. Approved Budget			
1. Research	$ 248,000.00	$ 297,000.00 (1)	$ 265,000.00
2. Administration	58,000.00	62,330.00 (1)	76,875.00
3. Total	$ 306,000.00	$ 359,330.00	$ 341,875.00
B. Receipts			
4. Pig Lead Assessment	$ 284,579.00	$ 365,039.00 (34¢/ton)	$ 290,680.00 - 26¢/ton 1,118,00
5. Interest on Savings Accounts		1,800.00	1,800.00 ($50,000)
6. Carry-over from Previous Yrs.			52,723.34 (2)
7. Total	$ 284,579.00	$ 366,839.00	$ 345,203.34
C. Disbursements from Each Budget Year			
8. Research	$ 197,498.29	$ 117,170.17	$ 144,750.00
9. Administration	62,195.23	62,461.14	76,875.00
10. Total	$ 259,693.52	$ 179,631.31	$ 221,625.00
D. Balance Available for Operations			
11. (Line 7-10)	$ 24,885.48	$ 187,207.69	$ 123,578.34
E. Remaining Project Expenditures			
12. Projects Under Contract		$ 61,369.83	$ 70,250.00
13. Projects Approved-Contract will be let	$ 22,000.00	76,000.00	
14. Total	$ 22,000.00	$ 137,369.83	$ 70,250.00
F. Reserve Fund			
15. (Line 11-14)	$ 2,885.48	$ 49,837.86	$ 53,328.34

LIA-Expanded Research Program
Budget Performance

	I 1959 Budget Performance (As of 12/31/60)	II 1960 Budget Performance (As of 12/31/60)	III 1961 Proposed Budget
G. Cash on Hand			
16. From 1958 Budget			
17. From 1959 Budget	$ 92,888.62	$ 24,885.48 (I-11)	
18. From 1960 Budget		187,207.69 (II 14 + II-15)	
19. From 1961 Budget			$ 123,578.34 (III-14 + III-15
20. Total	$ 92,888.62 12/31/59	$ 212,093.17 (3) 12/31/60	$ 123,578.34
H. Cumulative Disbursements from All Budgets During Fiscal Year			
	1959 Fiscal Year	1960 Fiscal Year	1961 Fiscal Year
21. From 1959 Budget	$ 174,039.66	$ 85,653.86	$ 22,000.00
22. From 1960 Budget	-	179,631.31	137,369.83
23. From 1961 Budget	-	-	221,625.00
24. Total	$ 174,039.66	$ 265,285.17	$ 380,994.83

(1) $3,900 transferred from approved Administrative Budget to Research Budget.
(2) 1959 & 1960 Reserves (Items I-15 & II-15) carried forward into 1961 Receipts (III-6).
(3) During fiscal 1961 $159,369.83 of this will be expended on 1959 & 1960 approved projects; the remainder, $52,723.34, is transferred

RECAPITULATION OF L.I.A. BUDGET DATA (ESTIMATED)

	Expenditures 1960	Expenditures 1961	Reserves Jan. 1, 1961	Reserves Jan. 1, 1962
Ordinary Fund	$ 74,800	$ 63,400	$ 56,100	$ 56,100
Pension Fund	-	23,900	132,900	126,900
Health and Safety Fund	18,400	15,450	24,000	24,000
Industry Development Fund	241,550	290,500	69,850	34,350
Research Fund	265,285	380,995	212,093	123,578
TOTAL	$600,035	$774,245	$494,943	$364,928

LEAD INDUSTRIES ASSOCIATION

292 MADISON AVENUE

NEW YORK 17, N. Y.

November 25, 1960

SUBJECT: 1961 BUDGET DATA

To the Board of Directors
of the Lead Industries Association:

On the attached pages you will find data relative to the various Association budgets, including budgets approved for 1960, estimated actual expenditures in 1960, and recommended budgets for 1961, as follows:

1.	Ordinary Fund	Page 1
2.	Pension Fund	Page 1
3.	Health and Safety Fund	Page 2
4.	Industry Development Fund	Page 4

The Expanded Research Fund is to be sent separately by the Research Director.

Very truly yours,

Secretary

Att.

ORDINARY FUND BUDGET, 1961

	Approved 1960	Estimated Expenditures 1960	Recommended 1961
Rent and Light	$10,500	$ 8,500	$ 9,000
Moving and Related Expense	3,500	3,000	--
New Space Contingencies	1,000	1,000	--
Salaries and Social Sec. Taxes	30,700	28,800	30,700
* Group Insurance	1,200	1,100	300
Furniture, Fixtures and Equipment	2,000	2,700	2,000
Travel	5,000	5,000	5,000
Entertainment and Luncheons	1,000	1,300	1,000
Meetings	2,500	2,500	2,500
Office Supplies	2,100	2,500	2,500
Mailing	2,500	1,500	2,000
Telephone and Telegraph	1,500	2,500	2,000
Association Dues	100	100	100
Books and Subscriptions	300	300	300
Printing	500	500	500
* Pension Fund	13,000	10,000	3,000
Miscellaneous and Contingencies	2,500	3,500	2,500
	$ 79,900	$ 74,800	$ 63,400

* Distributed to Industry Development Fund in proportion to salaries in 1961.

	Estimated at Beginning of 1960	Estimated as of November 1960
Balance, January 1, 1960	$ 51,300	$ 51,300
Receipts, 1960	79,900	79,600
	131,200	130,900
Expenditures, 1960	79,900	74,800
Balance, January 1, 1961	$ 51,300	$ 56,100

PENSION FUND

	1960	1961
Balance, January 1	$122,800	$132,900
Receipts:		
Transfer from Other Funds	6,200	13,000
Interest	3,900	4,900
	132,900	150,800
Disbursements:		
Retirement Annuity	--	23,900
Balance, December 31	$132,900	$126,900

HEALTH AND SAFETY BUDGET, 1961

	Approved 1960	Estimated Expenditures 1960	Recommended 1961
Salaries and Social Sec. Taxes	$17,800	$10,800	$ 7,500
Travel	2,500	1,200	1,500
Entertainment and Luncheons	400	150	300
Office Supplies	500	250	400
Telephone and Telegraph	300	250	300
Books and Subscriptions	600	600	600
Association Dues	150	150	150
Mailing	500	200	400
Research and Research Materials	2,500	2,100	500
Legal and Consulting Fees	--	1,500	2,500
Meetings	--	200	300
Miscellaneous and Contingencies	500	1,000	1,000
	$25,750	$18,400	$15,450

	Estimated at Beginning of 1960	Estimated as of November 1960
Balance, January 1, 1960	$16,700	$16,700
Receipts, 1960	25,700	25,700
	42,400	42,400
Expenditures, 1960	25,700	18,400
Balance, January 1, 1961	$16,700	$24,000

The total recommended for 1961 for the Ordinary Fund is substantially lower than that approved for 1960, largely as the result of two factors. First, expenses connected with moving of the Association's headquarters, which appeared in the 1960 budget, will not recur in 1961. Second, in the past all costs of the Pension Fund and Group Insurance have been charged to the Ordinary Fund, whereas Salaries on which these costs are based, have been distributed between the Ordinary and Industry Development Funds. To be consistent it seems logical to distribute these costs between the latter two funds in approximate proportion to the Salaries, which has been done in the 1961 recommendations.

The Health and Safety Fund recommended for 1961 is also substantially lower than 1960 for two reasons. First, the 1960 budget contained a nonrecurring Research item of $2,000 not included in 1961. Second, our Health and Safety Director, who died during 1960, has not as yet been replaced. The 1961 budget as finally adopted will depend on the Board's action for carrying on this work, but the one presented here provides only for employment of a good medical secretary to handle the routine work in this field, the use of consultants when needed for special problems, and other health matters to be handled by Messrs. Ziegfeld and Borcina. Another alternative, somewhat more costly, might be the employment of a young industrial hygienist instead of a medical secretary at a salary lower than that previously paid the director.

The Pension Fund will, for the first time, show an expenditure due to the impending retirement of Mr. Homer Yetman in August, 1961.

It is estimated that the following subscription rates per ton for the Ordinary Fund, including Health and Safety, will be required to yield the necessary funds in 1961 as compared with rates charged in 1960:

Mining		Smelting & Refining		Manufacturing		Assembled Articles	
1960	1961	1960	1961	1960	1961	1960	1961
20¢	12¢	5¢	3¢	5¢	3¢	2.5¢	1.5¢

INDUSTRY DEVELOPMENT FUND BUDGET, 1961

	Approved 1960	Estimated Expenditures 1960	Recommended 1961
Publications:			
"Lead"	$ 22,000	$ 22,000	$ 22,000
Reprints	2,000	2,000	2,000
Construction Bulletins and Architectural Flyers	5,000	3,500	4,000
* Sound Attenuation Report	5,000	4,500	--
* Cable Sheathing Report	3,000	1,000	--
Plumbing Textbook	3,000	4,400	--
Ceramic Supplements	3,000	4,000	3,000
Sweet's Architectural and Light Construction Catalogs	7,000	7,000	7,000
Sweet's Design Catalog	6,500	6,500	6,500
Pigment Technical Letters	3,000	3,000	--
Pigment Manual	--	--	2,000
* Antivibration Report	5,000	--	5,000
* Delivery Truck Brochure	4,000	1,000	4,000
ACS Monograph	--	--	1,000
Total Publications	68,500	58,900	56,500
Advertising:			
Product Design	12,000	12,000	12,000
Construction (Metals)	10,000	9,000	24,000
Pigments	9,000	9,000	--
Ceramics	10,000	11,000	11,000
* Anodes	3,000	3,000	--
Miscellaneous	--	1,200	1,200
Total Advertising	44,000	45,200	48,200
Miscellaneous Promotion:			
Publicity	7,500	7,500	--
** Conventions and Exhibits	16,500	20,000	16,500
Apprentice Contest	600	600	600
Total Miscellaneous Promotion	24,600	28,100	17,100
Administrative & Technical Service:			
Salaries and Taxes	85,000	83,000	97,000
Group Insurance	--	--	1,000
Rent and Light	7,000	5,000	7,000
Pension Fund	--	--	10,000
Consulting Fees	3,000	1,000	2,000
Travel	17,000	12,000	15,000
Test Programs	1,500	1,000	1,500
Entertainment and Luncheons	1,500	1,800	1,500
Meetings	1,000	750	1,000
Mailing	1,500	1,700	2,000
Association Dues	500	500	500
Telephone and Telegraph	700	600	700
Books and Subscriptions	500	500	500
** Miscellaneous and Contingencies	2,500	1,500	3,000
Total Administrative and Technical Service	121,700	109,350	142,700
* New Projects and Contingencies	10,000	--	15,000
TOTAL BASIC BUDGET	$268,800	$241,550	~~$279,500~~

INDUSTRY DEVELOPMENT FUND BUDGET, 1961

(Continued)

	Approved 1960	Estimated Expenditures 1960	Recommended 1961
Supplementary Items:			
~~Pigment Manual~~	--	--	~~8,000~~
Motion Picture Scenario	--	--	3,000
Expansion of "Lead" List	--	--	2,000
Total Supplementary Items	--	--	~~13,000~~ 5,000
GRAND TOTAL	$268,800	$241,550	~~$292,500~~ 284,800

* Taken from New Projects and Contingencies which was originally approved at $30,000.

** $1,500 taken from Miscellaneous and Contingencies which was originally approved at $4,000.

	Estimated at Beginning of 1960	Estimated as of November 1960
Balance, January 1, 1960	$ 43,400	$ 43,400
Receipts, 1960	268,800	268,000
	312,200	311,400
Expenditures, 1960	268,800	241,550
Balance, January 1, 1961	$ 43,400	$ 69,850

The Industry Development Fund is presented here in the identical form it is being presented to the Industry Development Committee and does not reflect that committee's final action on it. The Board will be informed of this action either at the meeting or earlier, if possible, but the short period of time, only three business days, between the Industry Development Committee and the Board meetings, makes any other procedure virtually impossible.

It will be seen that the basic budget presented is only slightly higher than in 1960, which is more than accounted for by the transfer of Pension and Group Insurance charges from the Ordinary to the Industry Development Fund. Salaries are substantially larger, but more than half of this is accounted for by the proposal to discontinue placing publicity through an outside agency and to handle it, we believe more effectively, by an addition to the staff.

Subscriptions were at the rate of 42 cents per ton on 640,000 tons of pig lead sold in the United States in 1959. Since approximately $27,000 less was spent in 1960 than was budgeted, this amount was added to reserves during the year.

Estimates given us by members based on 10 months' performance indicate sales in 1960 on which to base 1961 subscriptions will be about 15 per cent lower than in 1959, or about 545,000 tons. On the other hand, based

on the LIA pig lead sales report for 10 months, it does not appear likely that sales will be much more than about 510,000 tons.

The subscription rate for 1961 will depend on which of these estimates is accepted, the size of the budget approved, and whether the $27,000 added to reserves in 1960 or any other amount is taken from reserves in 1961.

Assuming that the $27,000 is applied against 1961 subscriptions, the rates per ton on the budgets suggested would be as follows:

Budget	Base Tonnage 545,000	Base Tonnage 510,000
$279,500 - 27,000 = 252,500	46¢	49¢
~~$292,500~~ 296,500 - 27,000 = ~~265,500~~ 263,500	49¢	52¢

The following notes are in explanation of the detailed Industry Development Fund budget items:

PUBLICATIONS

"Lead." This eight-page quarterly publication dealing with the overall uses of lead is circulated to a mailing list of approximately 50,000 people in the United States and, through the cooperation of the Lead Development Association and Association members outside of the United States, to an additional 4,500 people in the United Kingdom and Canada. We consider it one of our most valuable promotional media, and its publication should be maintained on at least the present basis.

Under the supplementary items appearing at the bottom of the recommended budget is one for $2,000 for expansion of the "Lead" mailing list. We feel that, if possible, the list should be expanded moderately to include additional classifications of readers as well as to enlarge existing ones.

Reprints. Each year a number of articles appear in the trade press, usually prepared by the Association staff or through staff cooperation with trade paper editors, which describe various uses of lead. It has been our practice to reprint the more valuable of these for circulation to our members and to other interested parties not covered by the circulation of the magazine in which they appear. We believe this practice should be continued.

Construction Bulletins and Architectural Flyers. These brochures dealing with the use of lead in construction are circulated primarily to architects and construction companies. We recommend budgeting a slightly smaller amount for 1961 than 1960 because we do not feel that sufficient good material is available for the preparation of such bulletins and flyers to warrant a larger appropriation.

Sound Attenuation Report. This report, based on the research report of Bolt Beranek and Newman, was published in 1960 and a large enough supply printed to take care of 1961 requirements. No appropriation for 1961 is recommended.

Cable Sheathing Report. This report was presented before the American Institute of Electrical Engineers in 1960 and summarized the research program, now completed, on the continuous extrusion of lead alloy cable sheath. Sufficient quantities of preprints of the report were obtained from AIEE for circulation among those interested at substantially less cost than was anticipated. No further publications on this subject are recommended for 1961.

Plumbing Textbook. Reprinting of this textbook, which is the official textbook of the Plumbers' Union, was accomplished in 1960 at a cost substantially exceeding the amount appropriated in the 1960 budget. This was to take advantage of a lower price per copy obtained by printing a larger quantity, which should take care of requirements for the next four or five years. This is a self-liquidating project, and the cost of printing will be recovered before another new printing is required.

Ceramic Supplements. These supplements to our loose-leaf technical data book, "Lead in the Ceramic Industries," have been well received by the ceramic industries. We recommend the same appropriation for 1961 as for 1960. In 1960 one additional six-page supplement was actually distributed and another one was prepared and is almost ready for distribution at this time.

Sweet's Architectural and Light Construction Catalogs. We have had two four-page catalogs in the Architectural and Light Construction Files of Sweet's for the last several years. One deals with lead sheet metal work and the other with lead plumbing. It is recommended that this be continued on the same basis in 1961.

Sweet's Design Catalog. For the first time we will have a 12-page catalog in Sweet's Design Engineering File in 1961, prepared and paid for in 1960. This covers a wide variety of lead applications, including many of its newer uses, and we recommend that it be continued in the 1962 file out of the 1961 budget.

Pigment Technical Letters. The 1960 budget provided for the publication of one rather extensive technical letter summarizing all previous technical letters, most of which are now out of print. It is recommended by the Pigments Technical Committee that no Pigment Technical Letters be included in the 1961 budget.

Pigment Manual. The Pigments Technical Committee, on the other hand, feels a need for basic information, particularly for the younger technical people in the paint industry, on lead pigments in general. They recommend the publication of a technical data book similar to "Lead in the Ceramic Industries" but applying to lead pigments and presenting the basic information as to the pigments available, their properties and uses. Such a manual is quite an extensive undertaking, and we do not believe that it could be completed and published in less than a year. We believe that its final cost will be at least $10,000 but that only $2,000 for preliminary expenses needs to be budgeted for 1961. This expenditure should not be made, however, unless an additional $8,000 can be assured either in the 1961 or 1962 budgets for final publication as it would be a tremendous waste of time to prepare the manual without assurance that it can be published.

Antivibration Report. Approval was given for $5,000 to be spent from the 1960 budget depending upon the outcome of the research program to determine engineering data on lead-asbestos antivibration pads. Since the report of the research contractors was negative and was concurred in by the Expanded Research Program, these funds were not used in 1960. We feel that the research data has not been completely evaluated and that a strong case can be made for the use of lead-asbestos antivibration pads even based on the so-called negative data contained in the research report. We are supported in this viewpoint by the wide interest in and general acceptance of these pads. We believe that funds should be provided for further development of the basic data included in the report and that funds should also be provided for publication of the useful information that can be developed from the report. While the evaluation of the report by engineers on our staff has not been fully completed, we feel sure that it will indicate a rather extensive market for these pads and performance data which will place them in a competitive position with other materials now being widely sold for the same purposes.

Delivery Truck Brochure. In the 1960 budget $4,000 was provided for publication of a brochure on storage battery powered street delivery trucks similar to the brochure issued a year ago on battery powered industrial trucks. When we attempted to prepare this brochure in cooperation with the Electric Storage Battery Company, it was found that the test data available, based on the short time these trucks had been tested on actual delivery routes, were insufficient for a convincing brochure. We therefore prevailed upon one of the trade papers serving the food industries to print a general article on the subject and plan to obtain a rather large quantity of reprints for our own distribution, which should cost not more than $1,000. We believe, however, that during 1961 the test data will be more complete and convincing and that the originally planned brochure should be published sometime during the coming year. Provision for this is made in the budget.

ACS Monograph. This monograph has been under preparation for several years and its publication delayed by several important delinquent authors. We have made some progress in obtaining the missing sections and hope to be ready for a final editorial job within the next few months. It is recommended that a moderate amount of money be made available for the preparation of necessary illustrations and other editorial work.

ADVERTISING

Product Design. We have been carrying six one-page ads each in "Materials in Design Engineering" and "Product Engineering" for the last couple of years. These are intended to appeal to design engineers and emphasize particularly the newer applications of lead. No change in this schedule is recommended for 1961.

Construction (Metals). Because of the recent publication of the Bolt Beranek and Newman report on lead as a sound barrier and continued industrial application of lead as an antivibration material, we recommend that the current advertising schedule on lead metal in "Engineering News-Record" be increased from seven to thirteen pages per year and that six pages in "Progressive Architecture" be added.

Pigments. No advertising on lead pigments is recommended for 1961 because of differences of opinion among members and because of the heavy advertising schedules of certain members on recently developed lead pigments.

Ceramics. No major change in the cost of the ceramic advertising schedule is recommended for 1961, although the Ceramics Committee prefers that a fewer number of insertions be used and that two colors be employed for greater attention-getting value.

Anodes. No advertising on lead anodes is recommended for 1961 since the ads run in 1960 attracted comparatively little attention, and it is believed that they may better be promoted by other methods, such as technical service and publicity.

Miscellaneous. This charge is a monthly service charge made by our advertising agency which has previously been absorbed in other budget items.

MISCELLANEOUS PROMOTION

Publicity. For the past several years we have budgeted $7,500 a year for publicity, primarily in trade papers, handled by our advertising agency. There has been a rather rapid turnover in personnel handling our publicity at the advertising agency, which has necessitated education of new personnel from time to time concerning our product. On the other hand, we have had notable success in placing trade paper articles about lead and its products through our own staff, which includes a former trade paper editor with a broad entree to trade publications and good knowledge of what they will publish. We recommend that the amount of money previously appropriated for publicity through the advertising agency be added to our salary account and that a young technical writer be added to our staff to assist the present staff member doing most of this work. We believe this will give us the benefit of full-time efforts by a staff member rather than half-time efforts by an agency employee and will release other present members of our staff for more technical service work in the field. Therefore no provision is made in the 1961 budget for publicity through our advertising agency.

Conventions and Exhibits. No change is recommended in the 1961 budget for conventions and exhibits as compared with the amount budgeted in 1960. It will be noted that we substantially exceeded our budget in 1960 due to the building of an entirely new exhibit. This means, however, that our cost for the exhibit itself should be lower in 1961 and probably also in 1962.

Apprentice Contest. No change is anticipated in the cost of this valuable work in the plumbing field.

ADMINISTRATIVE AND TECHNICAL SERVICE

Salaries and Taxes. The increase in the salary item reflects the change in the manner of handling publicity recommended in a foregoing paragraph as well as salary increases that may be anticipated with approval during the coming year.

Group Insurance. In the past this item has always been charged entirely to the Ordinary Fund. However, since salaries are distributed between the Ordinary Fund and the Industry Development Fund, it seems only consistent also to distribute the cost of group insurance in approximately the same ratio.

Rent and Light. No change is recommended in the amount budgeted for this item although we are now occupying our more commodious space.

Pension Fund. This item, like group insurance, has always been charged entirely to the Ordinary Fund, but it is suggested that in the future it be charged to both the Industry Development Fund and the Ordinary Fund in proportion to the manner in which salaries are charged.

Consulting Fees. A somewhat smaller amount is budgeted for this item in 1961 than in 1960 based on actual experience during the past year.

Travel. The same explanation holds with respect to this item.

Test Programs. This item is largely made up of our cooperative activities with the Steel Structures Painting Council, on the Research Committee of which we are represented. No change is recommended.

Remaining Administrative and Technical Service Items. These are in general minor and are more or less self explanatory.

NEW PROJECTS AND CONTINGENCIES

In 1960 $30,000 was provided as a fund to take care of new projects and contingencies developing during the course of the year. Of this amount $20,000 was approved for expenditure and $9,500 actually spent. On the basis of this experience, it is suggested that the fund for new projects and contingencies for 1961 be $15,000.

SUPPLEMENTARY ITEMS

Pigment Manual. Explained in the item bearing the same title under PUBLICATIONS.

Motion Picture Scenario. It is suggested that a subcommittee of three of the Industry Development Committee be established to work with the secretary in determining whether a motion picture of some kind should be produced and, if so, the general nature of the film. It is further suggested that, if this subcommittee agrees on a specific approach, $3,000 be provided to have a scenario prepared on which to base the decision to appropriate larger sums for the actual production of the film. Several other approaches might also be discussed, such as the production of a five-minute film for incorporation with others for television showing, planning it in a way that the five-minute film might be incorporated in a longer film for later production.

Expansion of "Lead" Mailing List. This has been discussed under the item entitled "Lead" under PUBLICATIONS.

Respectfully submitted,

Secretary-Treasurer

RLZ:JRH

ORDINARY FUND

	Approved 1961 Budget
Rent and Light	$9,000
Salaries and Social Security Taxes	30,700
Group Insurance	300
Furniture, Fixtures and Equipment	2,000
Travel	5,000
Entertainment and Luncheons	1,000
Meetings	2,500
Office Supplies	2,500
Mailing	2,000
Telephone and Telegraph	2,000
Association Dues	100
Books and Subscriptions	300
Printing	500
Pension Fund	3,000
Miscellaneous and Contingencies	2,500
Total Ordinary Fund Budget	$63,400

HEALTH AND SAFETY FUND

	Approved 1961 Budget
Salaries and Social Security Taxes	$7,500
Travel	1,500
Entertainment and Luncheons	300
Office Supplies	400
Telephone and Telegraph	300
Books and Subscriptions	600
Association Dues	150
Mailing	400
Research and Research Materials	500
Legal and Consulting Fees	2,500
Meetings	300
Miscellaneous and Contingencies	1,000
Total Health and Safety Fund Budget	$15,450

INDUSTRY DEVELOPMENT FUND

	Approved 1961 Budget	
Publications:		
"Lead"	$24,000	
Reprints	2,000	
Construction Bulletins and Architectural Flyers	4,000	
Ceramic Supplements	3,000	
Sweet's Architectural and Light Construction Catalogs	7,000	
Sweet's Design Catalog	6,500	
Pigment Manual	2,000	
Antivibration Report	5,000	
Delivery Truck Brochure	4,000	
ACS Monograph on Lead	1,000	
Total Publications		$58,500
Advertising:		
Machine Design	6,000	
Product Design	12,000	
Construction (Metals)	24,000	
Ceramics	11,000	
Miscellaneous	1,200	
Total Advertising		54,200
Miscellaneous Promotion:		
Motion Picture Scenario	3,000	
Conventions and Exhibits	16,500	
Apprentice Contest	600	
Total Miscellaneous Promotion		20,100
Administrative and Technical Service:		
Salaries and Social Security Taxes	97,000	
Group Insurance	1,000	
Rent and Light	7,000	
Pension Fund	10,000	
Consulting Fees	2,000	
Travel	15,000	
Test Programs	1,500	
Entertainment and Luncheons	1,500	
Meetings	1,000	
Mailing	2,000	
Association Dues	500	
Telephone and Telegraph	700	
Books and Subscriptions	500	
Miscellaneous and Contingencies	3,000	
Total Administrative and Technical Service		142,700
New Projects and Contingencies		15,000
Total Industry Development Fund Budget		$290,500

EXPANDED RESEARCH FUND-LEAD

BUDGET - 1961

Project Number	Title	Contract Price	Funds Available 1960	Funds Required 1961
	ELECTROCHEMICAL SUBCOMMITTEE			
LP-35	Fundamental Study of the Electrochemical Behavior of Lead in Various Media Including Cyclic Conditions	$10,000	$10,000	$ -
LP-36	High Speed Plating of Lead	25,000	10,000	15,000
	Chemical Reduction Plating	10,000	-	10,000
	Electrochemical Corrosion of Lead in Plating Equipment	5,000	-	5,000
LP-38	Corrosion Research Council	500	-	500
	Electrochemical Subcommittee-Subtotal	$50,500	$20,000	$30,500
	CHEMICAL SUBCOMMITTEE			
LP-18	Fundamental Study of Lead Organic Compounds	25,000	20,000	5,000
LP-28	Organolead Chemistry	10,000	10,000	-
	Evaluation of Lead Chemicals	10,000	-	10,000
LP-34	Development of a Primer Paint Incorporating Lead Compounds and Water Soluble Vehicles	25,000	-	25,000
	Lead Fellowship Programs:			
LP-12	Wettability of Lead Glazes Upon Structural Clay Bodies	2,500	-	2,500
LP-14	Phase Relationship and Physical Properties of Selected Ceramics Systems	3,870	-	3,870
LP-19	Low Temperature Lead Enamels Containing Molybdenum and Bismuth Oxides	3,000	-	3,000
LP-21	Development of Ultra Low-Loss Ceramic Dielectrics	3,000	-	3,000
LP-22	Fundamental Behavior of Lead in Glasses	3,000	-	3,000
LP-23	Study of Ferroelectrics Containing Lead Compounds	3,000	-	3,000
LP-37	Polymorphs of Lead Oxide	3,870	-	3,870
	Recommendation of Funds to Initiate two additional fellowships with particular reference to Glazes and Enamels	7,760	-	7,760
	Lead in Paints	10,000	-	10,000
LP-29	Fundamental Study of Surface Reactions on Lead	4,000	4,000	-
	Chemical Subcommittee-Subtotal	$114,000	$34,000	$80,000

EXPANDED RESEARCH FUND-LEAD (Continued)
BUDGET - 1961

Project Number	Title	Contract Price	Funds Available 1960	Funds Required 1961
	METALLURGICAL SUBCOMMITTEE			
LP-4	A Study of Lead Base Alloys	$28,500	-	$28,500
LP-8	Fundamental Investigation of the Powder Metallurgy Process for Producing Lead Alloys	16,000	-	16,000
LP-16	Lead for Sound Attenuation in Architecture	10,000	-	10,000
LP-26	Lead Coated Steel Can Stock	18,000	18,000	-
LP-31	Influence of Alloying Elements on Fatigue Resistance of Lead in Various Atmospheres	8,000	8,000	-
	Joining of Lead to Lead and Other Substrates	25,000	-	25,000
	Pilot Plant Production of Lead Powder Metallurgy Sheet and Extrusions	20,000	-	20,000
	Metallic Lead as a Lubricant	5,000	-	5,000
	Metallurgical Subcommittee-Subtotal	$130,500	$26,000	$104,500

Recapitulation		
Electrochemical Subcommittee	$30,500	
Chemical Subcommittee	80,000	
Metallurgical Subcommittee	104,500	$215,000
Undesignated Research Funds		50,000
Total Research		$265,000

APPROVED ADMINISTRATIVE BUDGET-1961

Salaries		$44,000
Rent		3,600
Printing and Office Supplies	(A) General	2,500
	(B) Quarterly Reports	2,000
Telephone and Telegraph		1,700
Postage and Express		850
Books and Periodicals		200
Furniture and Fixtures		1,100
Office Services		1,000
Committee Luncheons		1,000
Travel and Expenses		10,000
Professional Services	(A) Reproduction	275
	(B) Bookkeeping	1,000
	(C) Auditing	400
	(D) Legal	2,500
N.Y.State Disability Insurance		75
Taxes		825
Business Insurance		300
Group Insurance		100
Technical Association Memberships		200
Pension Liability		2,750
Miscellaneous Expense		500
Total Administrative		$76,875
Total Research		265,000
Total 1961 Budget		$341,875

Board of Directors
Meeting Minutes

Exhibit "E"
December 6, 1960

RESOLUTION

WHEREAS, Fred S. Mulock has served since 1955 as Director and since 1958 as Vice President of the Lead Industries Association, and whereas he is now retiring from his duties in the industry and Association, the Board of Directors desires to incorporate the following resolution in the minutes:

RESOLVED, that we extend to Fred S. Mulock an expression of thanks and appreciation for his generous cooperation and able leadership in the affairs of the Lead Industries Association.

UNITED STATES SMELTING REFINING AND MINING COMPANY
75 Federal Street
Boston 6, Mass.

June 1, 1960

Board of Directors
Lead Industries Association
292 Madison Avenue
New York 17, N.Y.

Gentlemen:

I greatly appreciate the resolution passed at the Board's meeting in St. Louis on April 6 relative to my service on the Board which was forwarded to me with Mr. Ziegfeld's letter of May 23.

It has been a real pleasure to me to work with the members, both present and past, not only during my incumbency as a Director but also informally during some twenty years previous to that time. I wish the members of the Board and the Association every success in the coming years.

Sincerely,

F. S. Mulock (Signed)

P.S. I believe it was Mark Twain who made the comment to the effect "The reports of my death have been greatly exaggerated." Somewhat the same comment applies in my case, as I expect to be carrying on in the industry at the same old stand until the end of this year.

F.S.M.

RESOLUTION

WHEREAS, Felix Edgar Wormser has, for the past 32 years, contributed generously of his time, energy and ability toward the growth and success of the Lead Industries Association, the Board of Directors, upon his retirement, desires to incorporate the following resolution in the minutes:

RESOLVED, that we recognize the excellent, energetic and intelligent service that Felix Edgar Wormser has rendered through his efforts as first Secretary and Treasurer of the Association, and subsequently as President, Vice President and Director for many years, and express to him our gratitude and appreciation for his outstanding contributions to the Lead Industries Association and to the lead industry.

FELIX EDGAR WORMSER
Consulting Mining Engineer
444 Madison Avenue
New York 17, N.Y.

May 27, 1960

Dear Bob:

Please convey my deep appreciation to the Board of Directors of the L.I.A. for the unexpected and, I admit, quite delightful honor the Board has paid me in the form of a resolution commemorating my service with the Association.

I am glad that I had a part to play in helping to bring the L.I.A. to its present position of international renown. I shall always treasure the many friendships I have made among the membership and it goes without saying that if there is anything I can do to further the best interests of the L.I.A. command me.

With kindest regards to all,

Sincerely yours,

Felix E. Wormser (Signed)

Mr. Robert L. Ziegfeld
Secretary
Lead Industries Association
292 Madison Avenue
New York 17, N.Y.