LEAD INDUSTRIES ASSOCIATION

420 LEXINGTON AVENUE

NEW YORK 17, N. Y.

SUBJECT TO REVISION

ANNUAL MEETING OF THE MEMBERS OF THE
LEAD INDUSTRIES ASSOCIATION

St. Louis, Mo. April 24-25, 1956

The annual meeting of the members of the Lead Industries Association was held on Tuesday and Wednesday, April 24-25, 1956, at the Statler Hotel, St. Louis, Mo.

MEMBERS PRESENT

	Representing
Harold Hartzog	Alpha Metals, Inc.
Harold Shonberg	do
William R. Black	American Metal Co. Ltd.
Clarence K. Conard	do
Vincent E. Dorman	do
Robert Gremald	do
J. J. Lennon	do
Myron L. Trilsch	do
Jean Vuilleques	do
William B. Clancy	American Smelting & Refining Co.
Charles Earl, Jr.	do
Robert A. Koch	do
A. J. Phillips	do
Carl H. Cotterill	American Zinc, Lead & Smelting Co.
Howard L. Young	do
Richard A. Young	do
Frank P. Barton	O. A. Avril Co., Lead Products Division
Julian S. Bers	Bers & Co. Inc.
John D. Bradley	The Bunker Hill Co.
Harold E. Lee	do
Ernest A. Torney	do
Wallace G. Woolf	do
Ralph Cutler	Broken Hill Associated Smelters Pty., Ltd.
Sidney E. Sweet	(C. Tennant, Sons & Co., Agents)
Ivor Thompson	do
J. W. Hanley	Cerro de Pasco Corp.
A. Russell Mers	do
R. C. Bell	Consolidated Mining & Smelting Co. of Canada Ltd.
A. D. Turnbull	do
O. C. Wilson	do
A. O. Wolff	do
Henry L. Day	Day Mines, Inc.
J. A. Stone	Division Lead Co.
C. E. Bassett	Dixie Lead Co.

Harold F. Jones	E. I. duPont de Nemours & Co.
W. S. Malvin	do
S. J. Stickley	do
W. D. Atteberry	Eagle-Picher Co.
Miles M. Joller	do
Kenneth W. Green	Electric Storage Battery Co.
C. G. Grimes	do
E. R. Anderson	Ethyl Corp.
J. A. Costello	do
M. Foodim	Federated Metals Div., American Smelting
Edgar L. Newhouse, III	& Refining Co.
Frederick Walker	do
Harvey Farer	Aaron Farer & Sons Co.
R. A. Gardiner, Jr.	Gardiner Metal Co.
Donald F. Goldsmith	Goldsmith Bros. Smelting & Refining Co.
Herbert A. Sher	do
Clarence Glass	International Smelting & Refining Co.
Frank A. Wardlaw, Jr.	(Anaconda Sales Co., Agents)
William F. Murdock	Murdock Lead Products Co.
E. R. Dondorf	National Lead Co.
A. H. Drewes	do
J. A. Martino	do
D. A. Marson	do
J. H. Reid	do
Phil W. Ruppert	do
W. J. Welch	do
Albert Silver	North Broken Hill, Ltd.
Roger H. Cutting	Northwest Lead Co.
Kenneth T. Gordon	Okonite Co.
William A. Oakey	Olin Mathieson Chemical Corp.
J. J. Sharkey	do
Jens Jensen	Pend Oreille Mines & Metals Co.
C. M. Chapin, Jr.	St. Joseph Lead Co.
Andrew Fletcher	do
C. R. Ince	do
W. T. Isbell	do
Carleton C. Long	do
George F. Weaton	do
Victor Besso	Societe Miniere & Metallurgique de Penarroya
Y. H. Robert	(International Selling Corp. Agents)
G. H. LeFevre	United States Smelting Refining & Mining Co.
Oscar A. Glaeser	do
F. S. Mulock	do
F. C. Sayers	do
F. L. Warner	do
Howard Novasel	Victory White Metal Co.
Reuben Vicner	Hyman Vicner & Sons
Carl H. Shaffer	Western Electric Co. Inc.
Leo L. Bledsoe	Western Lead Products Co.
Robert M. Quenell	do

REPRESENTED BY PROXY

Allied Smelting Corp.
W. P. Fuller & Co.
Glaser Lead Co., Inc.
Hammond Lead Products, Inc.
Hecla Mining Co.
Imperial Type Metal Co.
Johnston Foil Mfg. Co.
Lead Products Co. Inc.
John R. MacGregor Lead Co.
Metro Smelting Co.
Pennsylvania Smelting & Refining Co.
Phelps Dodge Copper Products Corp.
River Smelting & Refining Co.
Rochester Lead Works Inc.
Standard Rolling Mills, Div. Revere Copper & Brass Inc.
White Metal Rolling & Stamping Corp.

GUESTS

Georges Andrew-Dumont	Indussa Corp.
Joseph Barbash	Debevoise, Plimpton & McLean
Philip R. Blanc	Indussa Corp.
John M. Campbell	General Motors Research Staff
Donald A. Carroll	Donald Carroll Metals Inc.
Prof. H. H. Duncan	University of Melbourne
J. O. Edwards	Canadian Mines Branch
E. L. Frank	Philipp Bros.
J. H. Godhaird	Societe Generale des Minerais
William D. Hook	W. R. Grace & Co.
Rutherford T. Johnstone, M.D.	Industrial Medical Consultant
J. J. Kelleher	Hercules Powder Co.
Max J. Konnard	Combined Metals Reduction Co.
Harold Lewald	Consultant
R. H. Loew	American Cyanamid Co.
Alfred S. Meyer	Meyer Metallurgical Corp.
R. E. Meolands	Canadian Department of Mines
Gordon L. Morem	British Metal Corp. (Canada) Ltd.
Raymond F. Orr	Athletic Mining & Smelting Co.
K. A. Phillips	American Zinc Co. of Illinois
G. W. Potter	Potter-Sims, Mines, Inc.
Miles P. Romney	Utah Mining Association
Prof. A. W. Schlechten	Missouri School of Mines
B. B. Steiner	Cumberland Battery Mfg. Co.(Association of American Battery Manufacturers Inc.)
M. J. Sullivan	International Minerals & Metals Corp.
Lyman M. Tondel, Jr.	Cleary, Gottlieb, Friendly & Hamilton
Robert Van de Venne	Societe Generale des Minerais
Kurt Weinberg	International Minerals & Metals Corp.
Curtis L. Wilson	Missouri School of Mines
Charles H. Winship, Jr.	Phelps Dodge Corp.

GOVERNMENT REPRESENTATIVES

Edmond E. Gotsch	U. S. Department of State
W. W. Hopton	Office of Minerals Mobilization, Dept. of Interior
Haine Kenworthy	U. S. Bureau of Mines
A. J. Martin	do
Burton M. Reynolds	do
H. W. St. Clair	do
Felix E. Wormser	U. S. Department of Interior

LEAD INDUSTRIES ASSOCIATION

Robert L. Ziegfeld, Secretary-Treasurer
David M. Borcina
Manfred Bowditch
Kempton H. Roll
Homer S. Yetman

Dr. L. L. Carrick, Consultant

The minutes of the previous meeting of April 27, 1955 were circulated to members after the meeting and no changes or corrections were received.

NOMINATING COMMITTEE

Mr. D. A. Merson, Chairman of the Nominating Committee, reported for his Committee, composed, in addition to himself, of Mr. F. A. Wardlaw, Jr., and Mr. T. G. Stover (Mr. C. H. Shaffer, alternate). In making the report for the Nominating Committee, he stated that the Committee had given special consideration this year to the fact that the Association was moving into joint offices with the American Zinc Institute and would, of necessity, be working more closely with that organization in the future. The Committee, therefore, felt that it would be wise to continue on the Board those who had been responsible for the decision to take this step so that they might guide the Association through at least the first year of the new arrangement.

The following slate was, therefore, placed in nomination by the Committee and there being no further nominations, the slate was unanimously elected:

BOARD OF DIRECTORS

	Representing
J. D. Bradley	The Bunker Hill Co.
K. C. Brownell	American Smelting & Refining Co.
J. A. Costello	Ethyl Corp.
W. H. H. Cranmer	New Park Mining Co.
H. L. Day	Day Mines, Inc.
S. A. Easton	The Bunker Hill Co.
Andrew Fletcher	St. Joseph Lead Co.
Clarence Glass	International Smelting & Refining Co. (Anaconda Sales Co., Agents)
K. W. Green	Electric Storage Battery Co.
J. A. Martino	National Lead Co.
F. S. Mulock	United States Smelting Refining & Mining Co.
J. P. Ruth	Glidden Co. (Euston Lead Co.)
Jean Vuilleques	Imperial Metal Co. Ltd.
Frederick Walker	Federated Metals Div., American Smelting & Refining Co.
M. M. Zoller	Eagle-Picher Co.

REPORT OF SECRETARY-TREASURER

The secretary-treasurer informed the membership that his report had been circulated to members on April 13, 1956 and he, therefore, only briefly summarized it, as attached.

REPORTS OF DIVISIONS AND COMMITTEES

Metallic Lead Products Division -
Pigments & Chemicals Division - Reports of these Divisions were presented at the divisional meetings and not at the general session, and are a part of the minutes of those divisions.

Technical Steering Committee -
Industry Development Committee -
Safety & Hygiene Division -
Cable Sheathing Task Group -
Ceramic Committee - Reports for these Committees and Divisions were presented and are attached.

ADDRESSES AT MEETING

The following papers were also delivered at the annual meeting, with copies made available to those members interested:

"World Lead and Zinc Supplies and Requirements"	Jean Vuilloques
"Zinc and Lead Mining in the United States"	M. P. Romney
"Effects of Technical Developments in Creating New Markets for Lead and Zinc"	Dr. A. J. Phillips
"Some Washington Observations"	Hon. F. E. Wormser
"Facts and Fallacies of Plumbism and What to Do About Them"	R. T. Johnstone, M.D.
"Outlook for Lead in Storage Batteries"	B. B. Steiner
"The Construction Outlook"	T. S. Holden
"Lead in Ammunition"	F. S. Elfred
"Lead Radiation Shielding"	Harold Lewald
"Outlook for Use of Lead in the Automotive Industry"	J. M. Campbell

LEAD DEVELOPMENT ASSOCIATION

The following cablegram was received from Mr. A. C. Drummond, Lead Development Association, England:

"BEST WISHES TO YOUR PRESIDENT, MEMBERS AND YOURSELF
ON THE OCCASION OF YOUR 28TH ANNUAL MEETING."

Secretary.

REPORT OF THE SECRETARY-TREASURER

In my opinion, the past year has been one of the most constructive and active in the annals of the Lead Industries Association. It saw the formal creation of our Technical Steering Committee and the Industry Development Committee, both of which have resulted in the Association embarking on new projects.

Tomorrow, you will hear more detailed reports on the activities of these two committees from men who have been closely connected with them, as well as a report from our director of health and safety on the activities in that important field. Later this afternoon the Metallic Lead Products Division will meet and discuss what we are doing in the promotion of lead in building construction, chemical construction and solder.

Tomorrow morning, the Pigments and Chemicals Division will meet and discuss the progress of our work in the promotion of red lead as a metal protective paint.

Later in that day the chairman of the Cable Sheathing Task Group of the Technical Steering Committee will tell you of the activities of this group and the chairman of the Ceramic Technical Committee will report on the progress and the outlook in that field.

During the past year then, our major promotional and educational activities have been along the following lines:

Promotion of lead in building and chemical construction and solder, through the Metallic Lead Products Division, which has been continuing for a number of years; promotion of red lead as a metal protective paint, another activity with considerable background; promotion of lead in the ceramic industries, a new activity of the Association; a survey of the market for lead as a shielding material against radio activity; investigation of methods to protect the market for lead as a cable sheathing material; preparation of a Monograph on Lead for the American Chemical Society, to be published by the Reinhold Publishing Co., continued publication of our magazine, LEAD, on a more frequent publication basis and with a larger circulation; preparation of articles on lead and its products for a variety of trade papers and text books.

The Monograph is a new activity under the chairmanship of Dr. Alex. Stewart, director of research of the National Lead Co. We have entered into an agreement with the publishing company and the American Chemical Society to edit this work, which will be a one or two-volume treatise of some 700 to 800 pages. An outlined has been prepared and approved by the American Chemical Society editor. A number of authors for each chapter were also suggested to the American Chemical Society and their preference indicated to us. Authors for perhaps 20 per cent of the text have already been secured and their work, we hope, is under way. We ask the full cooperation of the membership in the preparation of this book whenever we may request an individual member to author a chapter or supply material. We feel that this is an excellent means, at little cost to us other than time, to disseminate widely full technical and practical information about lead which may lead other industries to find new applications for our products.

Getting away from promotional activities are our work in the field of lead hygiene and our statistical services, as well as the dissemination of a large amount of economic information about the industry upon request both to members and to many non-members such as Government agencies, banks, investment concerns and other

I think of particular interest is the closer arrangements we now have with the American Zinc Institute which should result in better service to the members of both organizations. Last year, the joint meeting of the two organizations seemed to meet with general approval and saved many members considerable time and expense. I hope that this meeting will show even better results.

Around July 1 the two organizations will occupy adjacent office quarters with a common reception and board room, providing better facilities for board and committee meetings and some economies and we hope saving the time of members who visit both organizations.

I am going to conclude my report at this point and let each of the major activities speak for themselves.

As for our financial condition, the auditor's report for December 31 last shows that total assets of about $208,000, practically all in cash, including savings banks accounts of about $92,000. Liabilities consisted almost entirely of reserves for Association activities as follows:

Ordinary Fund	$51,000
Safety & Hygiene Fund	27,000
Metallic Lead Products Fund	25,000
Pigments & Chemicals Fund	9,000
Industry Development Fund	10,000
Ceramic Fund	2,000
Radiation Shielding Fund	2,500
Pension Fund	79,000

REPORT OF THE TECHNICAL STEERING COMMITTEE*

Albert J. Phillips

Vice President and Director of Research
American Smelting and Refining Company
Chairman, L.I.A. Technical Steering Committee

The Technical Steering Committee of the Lead Industries Association had one meeting at the time of the Annual Meeting on April 24, 1955 and at this meeting the general type of organization for the Steering Committee was considered. It was agreed that the Steering Committee would merely be advisory in capacity and that where work was called for a Task Force would be appointed to handle the matter, with the help of the Secretary and approval of the Board of Directors of the Association.

It was decided to create a Task Force to consider the development of new lead alloys for cable sheathing. A report has been received on the activities of this Task Force for the year.

After considering the field of lead for nuclear shielding, the Committee recommended the retaining of a consultant to prepare a report on this subject. This was done and a report received and distributed to all members.

In the case of lead in ceramics, the Committee, likewise, recommended the retaining of a qualified consultant. This was done and a report from the consultant received and presented at the Annual Meeting.

It was the unqualified opinion of the Steering Committee that the Association should undertake to prepare the ACS Monograph on Lead and that it should be done by means of an Editing Committee, who would select authors and review manuscripts prior to submission to the publisher. The Association is fortunate in that Dr. Alex Stewart agreed to serve as Chairman of the Editing Committee. His Committee has already selected most of the authors for the Monograph.

In February, 1956 a meeting of the Technical Steering Committee was held in order to review the report on nuclear shielding and at that time it was decided that further work by the consultant was not needed and that the Lead Industries Association should have on its staff someone qualified to gather the pertinent information on the use of lead in radiation shielding and disseminate it throughout the atomic and x-ray industries. Action along this line has not as yet been completed but plans are being made.

*Presented at the 23th Annual Meeting,
Lead Industries Association, April 24-25,
1956, St. Louis, Mo.

REPORT OF INDUSTRY DEVELOPMENT COMMITTEE*

C. R. Ince
Vice President, St. Joseph Lead Co.

Toward the latter part of 1954 a group of the lead producers of the Lead Industries Association decided that a more intensive market development program should be undertaken by the industry to retain and, if possible, enlarge existing markets, and also investigate and promote potential outlets for lead. With this objective in mind they agreed to subscribe to a new fund to be known as the Industry Development Fund, each contributing an equal amount of money per ton of lead sold in the United States. This money was to be spent as recommended by a committee composed of all companies subscribing to the fund, with approval of the Board of Directors of the L.I.A. Thus, for the first time the Association had available for market development a fund which could be used wherever the occasion seemed to warrant.

First appropriations from the Fund were made to take over the major burden of supporting the Metallic Lead Products Division and Pigments and Chemicals Division. The former division is devoted to the promotion of lead in the fields of building and chemical construction and the latter devoted primarily to red lead paints. Both of these divisions are holding meetings during these sessions and their activities will be reported on. All members are welcome to attend these division meetings.

The Committee also considers recommendati ns which are made by the Technical Steering Committee. An appropriation was approved to make a survey of the market for lead in radiation shielding. This survey has been completed and copies circulated to the members and the Technical Steering Committee. The latter feel that a substantial market is, or will be, available to us in this field and we have approved a recommendation of that committee that the Association staff have a man "Q" cleared to gather all available information about the use of lead as a shielding material and disseminate it through a series of technical bulletins to the atomic industry. Retaining a recognized consultant to guide the staff was also recommended. This recommendation is now before the Board of Directors.

In connection with the use of lead in cable sheathing, a Task Group has been set up and has held its third meeting in an attempt to solve the problem of continuous extrusion of lead alloys as a means of improving the cable sheath market for lead. This work is progressing but so far has not required any appropriation from the Industry Development Fund.

In the field of lead in ceramics, a technical committee made up from members who supply products to the ceramic industries was organized and funds appropriated for a program to develop the market for lead in ceramics, about which you will hear tomorrow.

The Industry Development Committee has also provided funds to increase the frequency of publication of the Association's magazine "Lead" from two to four times a year starting with the beginning of 1956. The circulation of this publication has been expanded to over 50,000 names by including additional architects, ceramists and other groups with potential interest in lead products.

* Presented at the 28th Annual Meeting,
Lead Industries Association,
April 24-25, 1956, St. Louis, Mo.

The formation of an Industry Development Committee and the establishment of the Fund gives the Association much more flexibility in its operations than any arrangement we have had in the past, and I hope will help us to take advantage of situations as they arise. The companies contributing to this Fund are:

American Metal Company, Ltd. (including Tsumeb)
American Smelting & Refining Company
Anaconda Company (including International Smelting & Refining Co.)
Broken Hill Associate Smelters Pty., Ltd.
The Bunker Hill Company
Cerro de Pasco Corporation
Consolidated Mining & Smelting Company of Canada, Ltd.
St. Joseph Lead Company
United States Smelting, Refining & Mining Company

The work of the Industry Development Committee has only started, having had just one year of full operation. It has already shown tangible results and we hope its activities will continue to receive the "cooperation" of the consumer members of the Association.

REPORT OF HEALTH AND SAFETY DIVISION*

Manfred Bowditch, Director

Rather than risk boring you with detailed statistics of activities, I will say only that the health and safety work continues to show a healthy growth (there has been an increase of at least 50 per cent since its inception) and will give a few examples illustrating its more important phases.

CHILDHOOD LEAD POISONING

Because of the difficulty of its solution and the great amount of adverse publicity which it engenders, childhood lead poisoning has continued to be a major time-consuming headache. A recent news item in the New York Daily News with the headline "Lead Poisoning Killed 10 Kids in Brooklyn in '55, Highest Toll in the City," is a typical example of the latter. Through our responses to the inquiries of physicians, hospitals and clinic , the sponsorship of research, and cooperation with such organizations as the American Academy of Pediatrics and American Medical Association, I believe that we are securing a better understanding of this problem and more reasonable attitudes towards it.

INDUSTRIAL LEAD POISONING

Although the recognition of lead poisoning as a disease dates back to antiquity, and despite the fact that its causes and control are well understood, yet, as Dr. Kehoe has told us, there has been a diminution in the severity of industrial cases, rather than in their total number. This is illustrated by the fact that inquiries and case reports continue with little change in the annual total. A primary need here, as Dr. Johnstone said yesterday, is better instruction of our physicians.

INDUSTRIAL MEDICAL AND HEALTH SERVICES

There is gratifying evidence of a greater recognition of the importance of adequate medical and health services on the part of the larger companies. Two examples of this have been an inquiry from a non-member company as to a physician suitable for appointment as over-all medical director, and a recent request from a representative of one of our members for advice in setting up a company-wide health program.

TREATMENT OF LEAD POISONING

The so-called EDTA therapy for plumbism, brought forward five years ago, is by far the greatest advance in this field in recent times. It continues to be a subject of intensive study, and a report of recent findings will shortly be mailed to all of our members.

*Presented at the 28th Annual Meeting,
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LEGISLATION

We continue to watch legislation adverse to the interests of our members. Three bills this year, two in New York and one in New Jersey, having to do with lead paints, were killed in committee. Two New York bills on air pollution have been recommitted for study and copies of a substitute draft bill prepared by the Associated Industries of New York State have been mailed to our members in that state. Because of the impossibility of keeping a close watch on 48 state legislatures, it would be most helpful if our members having installations in other states would notify us of adverse legislation coming to their attention.

UNIFORM LABELING

The trend towards more and more precautionary labeling regulations continues. Our effort here has been mainly to secure reasonable and uniform labeling requirements for lead compounds in all federal and state jurisdictions. This has been quite successful to date, with the elimination of objectionable wording from a labeling requirement of the U. S. General Services Administration the most recent episode. Modification of the New York City lead paint labeling regulation was secured by means of American Standard Z66.1, prepared by a committee of the American Standards Association, sponsored by the Lead Industries Association. The futility of the labeling approach has been brought to the attention of health officials in other large municipalities and appears to have caused them to reconsider any such plans.

UNIVERSITY OF MICHIGAN PLASTIC PIPE REPORT

Getting wind of a forthcoming report on the suitability of plastic pipe for potable water supplies in preparation at the University of Michigan, we arranged to see the galley proof of the report and, through contacts with members of the advisory committee on the report, were able to secure elimination of a number of statements adverse to the use of lead stabilizers. Copies of the report, expected this week, will be mailed to those of our members known to be interested and will be available to any others on request.

ALLEGATIONS AS TO SOURCES OF LEAD POISONING

Experience has convinced us that no theory as to the causation of lead poisoning is too crazy to be brought forward. No matter how absurd such a theory may be, it can find its way into print, and from then on is almost certain to be regarded as gospel. Dr. Johnstone has mentioned several of these wild notions. In conclusion let me emphasize one of these and cite three additional and very recent ones:

> A group in Los Angeles had put forward the claim that lead from the exhausts of motor vehicles constituted a menace to the public health. They were very vocal and went so far as to hold sizable mass meetings. We have secured figures on the lead found by official agencies in the street air of New York, Chicago, Los Angeles, Detroit, Cincinnati and other major cities, have found that none of these concentrations remotely approach a hazardous level, and have brought this fact to the attention of municipal health authorities and others, whereby it is believed that this ghost has been laid.
>
> A letter from a Washington physician, received in March, stated that "ingestion of newspaper has been the basis of lead poisoning in three of our more recent cases." His reference was to plumbism in small children. In reply, we pointed out that

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there is no lead in newsprint, and none in the ink with which newspapers are printed. Our request that he explain the source of the lead in these cases brought no response.

It would be of some interest, if it were so, to know that the eating or drinking of lead paints has become a favored means of committing suicide. Such we would have to conclude to be the case from a tabulation received from the American Public Health Association, showing eleven cases of attempted suicide, one of them successful, during 1955, by means of ingesting lead paints. Here we have a respected and important national organization, publisher of the American Journal of Public Health, putting forth a seemingly utterly absurd item of vital statistics. When we questioned this, the reply was that "it might be a clerical error." It quite obviously was.

Perhaps the craziest of all was a letter from a physician in Alabama, reporting in detail on the case of a housewife thought to be suffering from lead poisoning, alleging a urinary lead value some ten times that found in severe industrial cases, and suggesting that the patient's habit of biting off silk thread, while sewing might be the cause. Because of the association of this physician with an organization overseen by one of our leading industrial medical friends (and one blessed with a sense of humor), these theories were brought to the latter's attention and elicited the understanding and amusing reply from which, in closing, I will quote, with minor changes:

> "Anent the case of Mrs. X concerning whom the words 'lead poisoning' have appeared.
>
> "We are suggesting to Doctor Doe that the Health Department be requested to make an investigation to determine if possible whether Mrs. X has been ingesting lead from sources in the vicinity of her home. Should this prove to be the case, perhaps it can be stopped with these sequelae:
>
> a) Mrs. X would feel better;
>
> b) The hospitals would be relieved of dozens of admissions in addition to the dozens she has had;
>
> c) Our organization would be relieved of the necessity of continuing to pay hospital and physicians' charges through ensuing years;
>
> d) The clinicians, the Public Health authorities, our organization and the Lead Industries Association would all emerge triumphant for having had a part, and Mrs. X, we hope, along with all the others will happily live forever after."

REPORT OF CABLE SHEATHING TASK GROUP*

A. A. Smith, Jr.

Manager, Central Research Laboratories
American Smelting and Refining Co.
Chairman, L.I.A. Cable Sheathing Task Group
of the Technical Steering Committee

In June, 1955, a committee consisting of

A. A. Smith, Jr. - American Smelting & Refining Co.
T. M. Bouton ——— Bell Telephone Laboratories
W. T. Isbell ——— St. Joseph Lead Co.
C. J. Snyder ——— Anaconda Wire & Cable Co.
R. J. Wiseman ——— The Okonite Co.

was appointed by the Technical Steering Committee of the Lead Industries Association to study the use of lead in cable sheathing and to make suggestions as to possible improvements that could be made either in the alloys used or manufacturing methods. Later Mr. E. J. Merrell of Phelps Dodge Copper Products Corp. was added to the Committee.

Three meetings of the Committee have been held, and the tentative conclusions reached were:

1. that the power cable industry would like to see a better alloy than is currently being used, whether it be for continuous or intermittent extrusion, and

2. that both the power and communications cable industries would be interested in lead alloys with comparable properties to those they are now using on intermittent extrusion for continuous extrusion.

After considerable discussions it was felt that the development of a new alloy with greatly improved properties offered small chance of success considering the large amount of work that has been done over a period of many years. However, this possibility should not be entirely overlooked, and the Committee will keep it in mind.

It was suggested that a co-operative research program on continuous extrusion be considered with Pirelli-Milan and Lead Industries Association contact them with regard to power cable sheathing and to go as far as to offer them sufficient copper bearing and arsenical lead alloys for their experimental work. Mr. Bouton offered to contact them independently with respect to 1% antimonial lead communications cable sheathing alloy.

*Presented at the 28th Annual Meeting,
Lead Industries Association,
April 24-25, 1956, St. Louis, Mo.

Communications with Pirelli-Milan indicated that they have had reasonable success with laboratory extrusion of 1% antimonial lead alloy and hope to run a commercial test in the near future. They also hope to do some laboratory work on the arsenical lead alloys.

Mr. Morrison, chief engineer of the John Robertson Co., joined one of the meetings of the Committee, and he stated it was his belief that lead alloys could be extruded on continuous machines but certain modifications were necessary for each alloy.

It is felt by the Committee that the problem of continuously extruding lead alloys can only be solved on a commercial basis; and, of course, this may involve rather large expenditures. The Committee will give further consideration to the subject to see if a program can be developed which will give the answers with minimum cost.

REPORT ON LEAD IN CERAMICS*

Dr. John Koenig
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Chairman, L.I.A. Ceramic Technical Committee

The Ceramics Technical Committee met informally for the first time in July, 1955 to consider whether any activities on the part of the Association might improve the market for lead in all branches of the ceramic industries and, if so, what steps might be recommended to the Association's Industry Development and Executive Committees. At this meeting it was unanimously felt that there is a sizable market for lead products in the ceramic industries which might be further developed.

As a first step it was decided to recommend that all available information on the use of lead in ceramics be gathered into a manual for circulation to people connected with the ceramic industries, and that this manual be followed by supplements as new information became available. Until these steps were taken it was not felt that advertising or research should be considered since in the process of gathering the information for the manual loop-holes and weak spots in our knowledge would be developed.

These recommendations were presented to the Association's Industry Development and Executive Committees, together with a recommendation for an appropriation of $18,000 to carry the work to the end of 1956. Approval was granted and the Committee met formally in September. It is composed of:

	Representing
John W. Ayers, Jr.	Evans Lead Division, National Lead Co.
William J. Baldwin	Titanium Alloy Manufacturing Division, National Lead Co.
Thomas B. Blair	Western Lead Products Co.
Dudley H. Haskell	W. P. Fuller & Co.
Arthur Knight	Euston Lead Co. (Glidden Co.)
Willard Midgette	Eagle-Picher Co.
John S. Nordyke	Hammond Lead Products Co.

I was retained as consultant to the Association on ceramic matters and elected chairman of the Committee.

The Committee members divided the task of covering all phases of the use of lead in ceramics and individually submitted their reports to the Association's Secretary for the compilation of the first draft. A second meeting was held during February during which areas needing more attention were discussed. The manual is now nearing completion and should be published in the early summer.

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A list of about 4,000 ceramic people has been compiled from national and state ceramic association rosters to receive this brochure and subsequent additional material.

The many uses of lead in ceramics are to be referred to in the manual. Some of these are old established users, some recently developed and others in the research stage but look promising. All depend on one or more of the unique properties which lead imparts to ceramics, and no other material will serve the purpose.

Examples of Established Uses

We might briefly refer to several of these unique properties in connection with some of the old established uses of lead in ceramics:

(a) As a component of glaze compositions, the use of lead compounds provides many advantages, e.g., greater fluidity and wider softening range, improved texture and smoothness of surface, greater brilliance and generally a more fool-proof glaze. These advantages along with others (e.g. thermal expansion and elastic moduli considerations) make lead a highly valued ingredient of a number of white ware glazes for dinnerware and tableware, various types of ceramic tile, and for china plumbing fixtures.

(b) High index of refraction, along with other favorable properties accounts for the use of lead glasses for optical purposes and for the finest quality stemware and art glass.

(c) Lead glass is used widely for electrical and electronic applications because of the excellent electrical properties and working characteristics imparted by lead. Examples of uses here include stem and exhaust tubing, neon-sign tubing, and television picture tubes. Lead glasses have other important uses, e.g., reflective glass beads.

(d) Lead is commonly used in the dry process enameling of cast iron both in the ground coat and cover coat enamels. The main advantages impart by lead for this application result from greater smoothness and brilliance derived from its high fluxing property coupled with increased resistance to chipping and improved elasticity. Specific examples of this use include bath tubs and other vitreous enameled cast iron sanitaryware.

Examples of Relatively New Uses of Lead in Ceramic Products

Here are some examples of relatively new uses of lead in ceramic products:

(a) Lead is an important raw material in the only satisfactory enamel for aluminum providing a dense, hard surface and providing a maturing temperature in a wide firing range well below the temperature which would be detrimental to the aluminum base. High hopes are held for the future of this material.

(b) Lead glazes for ceramic dielectric bodies have been proven to be superior to all other type coatings in maintaining high resistivity under extreme conditions of humidity and temperature. The principle use here is in coating the many ceramic dielectric parts used as such or in components for high frequency electronic equipment such as radar.

(c) High lead glasses as a result of their high density and opacity to radioactive energy are finding use as a shielding material in radiation protective windows.

Recent Developments

Recent developments include many suggested unique uses of lead in ceramic products.

(a) Lead oxide-based piezoelectric ceramics for sensing elements in accelerometers, sound detectors, ultrasonic devices and transducers. Even with a complete replacement of the presently used material, the tonnage used here would be small. This is in contrast to the next item which would involve considerably more material. However, there are numeral small tonnage uses which would augment the larger uses.

(b) Ultra low loss high frequency insulation for electronics. Two types of bodies containing 40 to 70% lead bisilicate have been developed which have zero shrinkage. These provide for easier fabrication of parts where extremely close tolerances are prerequisite. The trend towards higher frequency electronic equipment has required the concurrent development of ultra low loss ceramic. The best ceramics made to date require the presence of lead in their formulation.

Sponsored research may help stimulate the extended use of lead. One example might be noted - the enameling of metals other than aluminum; e.g., - enameling of sheet steel with lead bearing enamels which are not now used for this purpose to any large extent and offer an extensive market. This is receiving considerable attention but on a confidential company basis and it is difficult to secure specific information on this since there are no publications. Sponsorship of research in selected areas such as this would result in publications which would accelerate the use of lead in specific applications by making the results generally available.

The Technical Committee may recommend to the Association's Industry Development and Executive Committees at the proper time specific programs in selected areas where they believe most good will be accomplished in extending the use of lead in ceramics.

The Technical Committee is optimistic in its outlook of the good which can be accomplished by the Association's efforts not simply from the standpoint of increased sales of lead to this industry but also in the continued development of special ceramic products which are superior as a result of the use of lead chemicals.

Several proposals of research studies have already been received but your Technical Committee felt that it was too soon to consider undertaking such studies, i.e., prior to careful consideration on the Committee's part as to which avenues would be most profitable.

Getting back to the brochure, it is the Committee's intention to make this manual into a valued source of information including data, formulas, bibliography, a chapter on handling of lead, and also a chapter on availability of lead chemicals and dependability of future lead supplies. The wide variety of properties to be discussed will serve to emphasize the great versatility of lead compounds in numerous ceramic formulations and will help to explain why lead can do so many things so well.