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may be areas of basic research that individual companies do not want to undertake which the industry as a whole could profitably explore. Research on the more economical application of lead products might also prove helpful in expanding markets for these products.

There also seems to be need for wider dissemination of information on the properties of lead and its products which will help them to find new or wider application.

With these thoughts in mind the following report of 1953 activities is presented. I am proud of the loyal and capable staff the Association boasts. David M. Bortina, Mrs. Alice Mayer and Miss Helene Kurbach have completed twenty or more years of service, with your Secretary having completed twenty-five years last month. The least that can be said is that there has rarely been a dull moment. And no report would be complete without a word about the cooperative spirit of the membership and thanks to the officers and directors for the time and wisdom they have contributed to the guidance of association affairs.

MEMBERSHIP

There were several changes in membership during the year, mostly occasioned by changes in ownership of companies or plants. New members included The Murdock Lead Products Co., Dallas, Texas, and The G. A. Avril Co., Cincinnati, Ohio, which acquired the plants formerly operated by the Eagle - Picher Co. in those cities. Allied Smelting Corp. of Milwaukee also became a member. Park Utah Consolidated Mines Co. and Silver King Coalition Mines Co., both of Salt Lake City, and both formerly members, were merged into United Park City Mines Co., which became a member. Chief Consolidated Mining Co. resigned because of the depressed lead market and the need to conserve its resources. Federal Mining & Smelting Co. was completely absorbed by American Smelting & Refining Co. and its separate membership was thus discontinued.

The membership now consists of 62 regular and 7 associate members.

MISCELLANEOUS SERVICES

This section of the secretary's report is placed near the beginning instead of being relegated to a catch-all at the end, because it is believed that its importance in consumption of staff time, value to the industry, and saving and service to members may be underestimated. By correspondence, telephone and personal visit the Association is literally deluged daily with requests for help in connection with lead. These come from newspapers, magazines and authors of books who want to verify facts or get additional information for articles dealing with lead. They come from schools, colleges and industrial or trade groups who want educational or other information for their students or members. They come from government agencies who want both economic and technical assistance, and from banks, brokers and advertising agencies. And many come from our members on both technical and economic problems.

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Here are a few examples:

1. A member asked us to determine the cause of bursting of a recently installed and apparently perfectly good lead service pipe. Involved a trip from New York to Pennsylvania.
2. Consulting engineers asked for type of lead plate to be used for supporting hinges for concrete structure.
3. A leading university asked for basic physical data on lead they were unable to find in "Metals Handbook" or other standard works.
4. A leading business publication and a leading trade paper asked for information on lead-acid and nickel-cadmium batteries for use in articles on the subject.
5. The Department of the Army asked for complete data on non-sparking lead floors for explosives plants to be included in a manual.
6. Two different architects and one member asked for data on lead-asbestos anti-vibration pads for building foundations.
7. The house organ of a large wholesaler of lead products asked for material for a general story on the lead industry.
8. A painting contractor asked for specific information on the relative merits of different metal-protective paints.
9. A member asked for assistance in reconciling the various statistics available on lead consumption and production.
10. A misloading error about the trend of lead prices was detected in a leading business magazine and corrected.

These are but ten meager examples, received within a period of a few days, of the inquiries which occupy a vast amount of staff time from day to day. Without the Association, either such inquiries in many cases would go unanswered to the detriment of the use of lead or the time of member companies, duplicated many times, would be consumed in answering them.

Statistics

No change was made in the statistical services of the Association during the year. We have continued to cooperate with other statistic gathering agencies, such as the American Bureau of Metal Statistics and the U. S. Bureau of Mines to avoid duplication and to try to iron out inconsistencies that appear in the various series of figures. The secretary again prepared the introductory summary to the lead section of the A.P.M.S. Yearbook. Many requests from both members and non-members for assistance in statistical studies of the lead industries were handled during the year. A request by the U. S. Tariff Commission to use our pig lead sales statistics was granted with the approval of reporting companies.

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An analysis of our statistical work indicated that only about 67 man-hours of staff time per month were involved in the production of routine statistics.

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To celebrate the twenty-fifth anniversary of the Association, it departed from customary procedure and held the annual meeting at The Greenbrier, White Sulphur Springs, W. Va., including the ladies in the social affairs. Total attendance was about 135, two-thirds being men. Business sessions were patterned after previous meetings and covered comprehensively the production and consumption problems of the industry. Members generally agreed that the meeting was highly successful and fittingly marked the occasion.

LOADING AND PACKAGING

The sub-committee dealing with this problem met during the Association's annual meeting and considered several suggestions for re-designed lead pigs. Subsequently individual members experimented in the field with some of these designs. At the year-end this work was still in progress and no ultimate solution had as yet been found.

Bulletins and Publications

Although published in 1952, the Association's book, "Lead in Modern Industry," continues to enjoy an active demand. The original print order was 7,500 copies. Of these, about 600 complimentary copies have been provided members and good friends of the Association and about 3,000 have been sold at \$1.50 for individual copies and \$1.00 for quantities of ten or more, something less than actual cost. Illustrative of the continued demand is the fact that about 1,300 copies were sold in 1953.

Only two issues of "Lead" were again published in 1953 as in 1952. These went to about 35,000 users and prospective users of lead such as architects, engineers, construction companies, chemical concerns, sheet metal contractors, city engineers and others. It continues to create wide interest in lead and publication of each issue is followed by voluminous correspondence with readers.

Eight Information Bulletins and three Defense Bulletins were circulated to members during the year.

Publications of the Divisions are not mentioned here but are included under the report on each Division.

Articles and Addresses

The secretary again prepared the annual review article on lead for "Engineering and Mining Journal."

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An article about the Association and its service was written for and published in the Buyer's Purchasing Digest, at the request of that publication.

The secretary addressed the annual meeting of the Idaho Mining Association on the invitation of that organization.

Other articles and addresses are covered under divisional activities.

GOVERNMENT RELATIONS

As government controls were removed from lead our contacts with Washington agencies shifted more and more from the emergency to permanent agencies. Regular liaison is maintained with all those agencies which are users, potential users or specifiers of lead or have anything to do with lead in research or in any other way. This includes most Federal government departments and agencies. The secretary serves on several committees, such as (1) Industry or Government Advisory Committee on Schedule B Revision, Bureau of Census; and (2) the Advisory Council on Federal Reports, Standard Industrial Classification Code, Committee on Primary Metal Industries and on Mining.

Miscellaneous Meetings

The Association was represented by invitation at the Mid-Century Conference on Resources for the Future sponsored by the Ford Foundation. The President of the Association, a member of the Executive Committee, and the secretary represented the Association.

Other meetings attended and organizations with which close liaison is maintained include the American Institute of Mining and Metallurgical Engineers, American Society for Metals, American Mining Congress, Association of American Battery Manufacturers, National Paint, Varnish and Lacquer Association, American Ceramic Society, American Society for Testing Materials, National Association of Corrosion Engineers, American Standards Association and others. The secretary and staff are active in committee work of many of these organizations in the interests of lead.

HYGIENE

The following is a summary of our principal activities in the field of lead hygiene in 1953. The importance of this work is tremendous in preventing undue discrimination against lead.

1. Childhood lead poisoning continues to be our major "headache" and source of adverse publicity. Threats of poison labeling regulations for lead paints have come from health authorities in New York, Chicago and some other cities. We are working with the Paint Association to combat these moves with the outcome promising, but still in doubt.

2. The research on childhood plumbism at Johns-Hopkins, supported by our grant of \$10,000 was completed in October and a report is expected shortly. The work is being continued for another year at no expense to

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3. Results of similar work, supported by us for a number of years at Harvard, will soon be published in two papers in the American Journal of Diseases of Children. These findings and those in item 2 should provide us with valuable facts useful in combatting the movements reported in item 1.

4. A statement, "Lead Poisoning in Infants and Children," was presented at a conference on Home Accident Prevention at the University of Michigan.

5. Over 2,100 people, mainly physicians, visited our exhibits on childhood plumbism at the annual meetings of the American Medical Association and the American Public Health Association.

6. A committee of the American Standards Association, in which both this Association and the Paint Association are well represented, has been formed to establish standards for "safe" labeling of paint for children's toys and furniture.

7. There have been no important new developments in industrial lead poisoning, although sporadic reports of cases are received. The American Medical Association is planning a session on this subject at its 1954 annual meeting.

8. "Ca EDTA," mentioned in last year's report, continues to justify earlier hopes as a treatment for lead poisoning and has been accepted by the Food and Drug Administration for intravenous injection. A major amount of time has been devoted to following and promoting this development.

9. Our investigation, including over 150 analyses of water from red-lead-painted tanks, has enabled us to stop publication of a paper somewhat unfavorable to red lead and secure a promise of revision.

10. A study of fume generation from welding and cutting of painted steel initiated at the behest of a member company is under way at Harvard and the Boston Naval Shipyard, with no report available yet.

11. Our efforts to promote adequate laboratory services to aid in diagnosis of lead poisoning are bearing fruit, with more or less adequate services now available in Baltimore, Boston, Cincinnati, Cleveland, Chicago, Denver, New York, Salt Lake City and Seattle.

12. Attendance at many national and regional meetings of health organizations has kept us in close touch with the medical profession and health authorities.

13. Adverse publicity at the rate of 30 to 40 newspaper items per month has appeared on the effects of lead on children, adults, livestock and wildlife. Wherever possible these have been followed up with a view to correcting misconceptions and misstatements, often with gratifying results.

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11. Plant study. A request for assistance in lead dust and fume control by one of our members was referred to the Institute of Industrial Medicine of New York University and lead to a thoroughgoing engineering and medical study. At the further request of the same member, a questionnaire relative to methods of medical and engineering control has been prepared by the N.Y.U. staff and our own to be mailed to a list of some 40 plants engaged in similar activities. Dissemination of the resultant information should be of great benefit to all concerned.

Metallic Lead Products Division

A report of this Division's activities was sent to members of the Division on November 10, 1950. The following summarizes those activities:

1. Our two field men concentrated on those areas where concerted efforts were being made to promote other materials at the expense of lead. In most cases substitution of other materials for lead was forestalled.
2. With the cooperation of members in supplying materials for plumbing classes at low cost, our program to promote the training of plumbers in lead work proceeded satisfactorily. In this we also had close cooperation from the Bureau of Apprenticeship, U. S. Department of Labor.
3. With the first printing of 3,000 copies of our textbook, "Lead Work for Modern Plumbing," sold in less than five months, a second printing of 3,000 copies was authorized and printed. All indications are that the second printing will be exhausted before the end of this year and that we will have derived the benefit of about \$8,000 worth of educational literature for a net cost of about \$2,000.
4. Plumbers' Forum was a valuable means of reaching 30,000 in the plumbing industry, but was published only twice during the year.
5. Our exhibit of lead wiping at the annual convention of the National Association of Plumbing Contractors created unusual interest with groups of 20 to 25 delegates at a time watching their colleagues try their skill.
6. Numerous requests from architects and engineers for assistance on plans for chemical laboratory piping installations led to preparation of a preliminary draft of specifications for such installations. This draft has been submitted to interested members for comment and it is expected that the specifications can be published shortly.
7. Our soldering Subcommittee of the American Welding Society Committee on Brazing and Soldering met several times during the year and considerable progress has been made toward preparation of the Soldering handbook to be published by the Welding Society.
8. About 600 additional copies of "Lead in Modern Plumbing" were distributed in answer to inquiries, bringing total distribution to about 27,000.

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9. Exhibits of plumbers' apprentice training activities were displayed at the New York State Apprenticeship Conference and the Annual Educational Conference sponsored by the Chicago Journeymen Plumbers.

10. Ten Housing Bulletins listing new military housing projects were issued for members.

11. A member of the staff serves on the Plumbing Committee of the Building Research Advisory Board of the National Research Council.

12. Material for a future article on the lead industry with particular reference to lead's use as a sheet metal was provided the editor of "Sheet Metal Workers Journal" and the article appeared in November.

13. Use of plastic tubing in competition with lead was investigated wherever possible. Failures were discovered and bulletins providing members with the details in two localities were issued.

14. Three Chemical Bulletins on the use of lead in chemical construction were issued for the use of members.

15. Two Chemical Construction Bulletins on the use of lead in this field were distributed to our list of about 1,300 colleges teaching chemical engineering, chemical construction companies, chemical manufacturers, consultants and others interested.

16. Two articles prepared by a staff member on lead in chemical construction were published in "Chemical Engineering" and another in "Industrial and Engineering Chemistry." Reprints were obtained and distributed.

17. Possibilities of a weld developed by Remington Arms Co. for reducing the cost of lead chemical installations were recognized and a joint testing program undertaken. The tests were highly successful and an article has since been published in "Chemical Engineering" describing the use of the weld in actual installations.

18. Because of the growing importance of radiation protection much time was spent on gathering material on the possibilities and use of lead for this purpose and articles are in preparation for suitable publications.

19. For the fourth year, a two-hour lecture on lead as an engineering material was presented to graduate students at the Newark College of Engineering.

20. Liaison was maintained with all principal technical societies and a staff member was vice-chairman of the Northeast Region of the National Association of Corrosion Engineers.

21. A tentative standard for lead pipe for chemical service was prepared as the result of a number of inquiries from large users for such a standard. It was circulated to members for comment but no action has been taken.

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Pigments and Chemicals Division

1. Field work on lead base metal protective paints was continued with industry, the military forces and other public agencies. Special emphasis was placed on the adaptability of new red lead base paint formulations developed by the Association for an increasing variety of applications and exposure conditions.

2. Cooperative work with the Navy has continued fruitful. In the final report of the work on bottom paints two red lead base paints were selected as best among 37 paints, and patch tests were initiated on a destroyer bottom.

The cooperative tests with the Philadelphia Naval Shipyard are still in progress with results to date clearly indicating superiority of red lead over zinc chromate paints for continuous or intermittent immersion.

3. A Military specification covering Navy Formula 116 (a red lead base primer containing 4 lb. of red lead per gallon) was issued. This paint is now used almost exclusively for top-side maintenance primer by the Navy. Another Military Specification was issued for a dark shade of the same paint for contrast in multiple coat systems.

4. Under the section of this report on "Hygiene" mention is made of a Navy - L.I.L. project in Boston on fumes from welding lead-painted steel. It was hoped that a favorable report from this project would establish Navy Formula 116 as a shop primer for steel and thus greatly extend the use of red lead. The project is not yet complete.

5. Our technical director served as secretary of the Government Advisory Committee on Chromate Pigments sponsored by the Army Corps of Engineers. This committee is evaluating lead and other chromate and red lead paints for metal protection. Elaborate exposure tests were initiated but results are not expected for another year.

6. We maintained our supporting membership in the Steel Structure Painting Council and our technical director served on its Research Committee. The Council published the first volume of its "Painting Manual" in which the first ten recommended painting systems for general service contain red lead. This should prove extremely valuable in promoting red lead as the leading metal protective paint.

7. A paper on metal protective paints was presented before the Southern New England and Eastern Wisconsin sections of the National Association of Corrosion Engineers.

8. An exhibit demonstrating the advantages and proper use of red lead and white lead in paints was displayed at the annual Paint Industries Show.

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9. Red Lead Technical Letter No. 8 was prepared for publication early in 1954. It is entitled "Primers for Railroad Structures and Rolling Stock." There has been a steady demand for these Technical Letters both from industry and from schools for use in paint courses.

10. A new research project was initiated by the Red Lead Technical Committee to determine the relative merits of vinyl metal surface conditioners and anti-corrosive paints containing red lead, zinc chromate and other potentially competitive pigments.

11. All L.I.A. and Navy cooperative test panel projects were inspected at least twice during the year. Our technical director also participated in inspections of various painted structures under the auspices of the U.S. Corps of Engineers and the Steel Structures Painting Council.

12. See item 9 under "Hygiene."

13. The Red Lead Technical Committee continued to meet throughout the year and to guide the work of this Division. Its contribution to the wider recognition of the pre-eminence of red paints as metal protective primers should not be underestimated by the membership. I feel that it is an outstanding example of successful and unselfish cooperative effort for the benefit of the industry.