

LEAD INDUSTRIES ASSOCIATION, INC.

282 MADISON AVENUE

NEW YORK, N. Y. 10017

TELEPHONE - AREA CODE 212

OR 6-2020

November 12, 1964

To All Members of the Health and Safety Committee:

The attached report may be of interest to you and for what it is worth here is a copy.

It is marked "CONFIDENTIAL" meaning that we hope it will not be used outside our industry.

Very truly yours,

Don G. Fowler

Don G. Fowler, Secretary
Health and Safety Committee

DOF:md
Enc.



Look Ahead with Lead

LEAD INDUSTRIES ASSOCIATION, INC.

100 MADISON AVENUE

NEW YORK, N. Y. 10017

TELEPHONE - AREA CODE 212

OR 9-6000

CONFIDENTIAL

November 10, 1964

EUROPEAN VISIT BY HEALTH AND SAFETY DIRECTOR

September 15 - October 7, 1964

This report covers a three-week visit to four countries in Europe--Italy, Germany, France, and England. The purpose of the visit was to contact the lead trade associations in each of these countries and discuss with them problems of health and safety in their particular area; to visit automobile production facilities in these countries and observe the precautions that these facilities use to keep lead hazards under control.

Automobile plants visited were Fiat, Mirafiori plant, Turin, Italy; Volkswagen Werke, Wolfsburg, Germany; Renault, Paris, France; and in England, Vauxhall (General Motors owned), Luton; Ford Motor Company, Dagenham; Pressed Steel, Oxford, Cowley.

Several other offices and facilities were visited and will be mentioned in the appropriate country write-up.

General Comments

The single most important impression received from my visits to the several manufacturing plants, and from conversations with their engineering and medical personnel, is that the great emphasis being placed in Europe on diagnosis and treatment tends to discourage in every instance the use of lead. The over-elaborate medical programs used everywhere give plant management the false impression that lead hazard control is extremely costly and that the best thing to do is to engineer the use of lead out of the plant.

We here in America have long ago learned that prevention is the best approach to the control of any plant hazard, and that engineering is the best means for providing effective control. I found that Europeans without exception take what is essentially a negative attitude towards lead hazard control in that a tacit assumption is made that there will be poisonings and that, therefore, they had better be set up to diagnose and treat them. Our view in America is essentially a positive approach, which we make by saying that we will engineer the hazard out of the process, and install a medical control program which will operate as an adjunct to the engineering phase.

This thesis can best be illustrated by the fact that American medical control programs in the automobile industry universally use the quantitative blood lead analysis instead of those methods such as stipple cell, urinary porphyrin, delta-aminolevulinic acid, etc., now used by the Europeans. The essential difference between these two measures is that the quantitative blood lead analysis allows one to predict, long in advance of any adverse effect, whether or not absorption is taking place. The European methods are measures of the effect of lead on the human body, and do not give positive results until absorption has taken place. In other words, our American methods operate on a quality control

Lead Absorbed with Lead

-2-

philosophy of measuring, in a very sensitive manner, what is happening to the man having a potential lead exposure; and we are able to take action to prevent that exposure from becoming excessive, long before the European methods would have alerted the physician.

The large number of medical personnel employed in plants such as Fiat, Renault, and several of the others I saw, are an additional indication of the European stress on diagnosis and treatment for poisonings. Another indication of this fact is the rather sloppy engineering of control measures that I saw in the several British automobile plants. There is a paradox here in that the sloppy engineering tends to become excessively fancy and expensive in the design of solder grinding booths, especially where difficulty in lead control is being experienced. Pressed Steel at Oxford, and Ford at Dagenham are instances of this. Expensive down-draft systems, plus expensive and unnecessary air filter systems are installed, or are being installed at these plants. Both of these refinements are unnecessary, and result in an overly costly installation. This of course reacts in a manner definitely unfavorable to lead by giving management the idea that a good control program is expensive. These two situations, namely, over-elaborate medical programs for diagnosis and treatment, and over-engineering of some of the controls for lead hazards, tend to prejudice management against the use of lead, and result in a definite movement towards designing lead out of the manufacturing process.

I believe this is the most important point to be covered in our conversations with our friends in Europe. Certainly those managements with whom I discussed the control approach that we have developed in America were most interested, and requested from me complete details on our methods of operation.

Smog and Air Pollution

A quick and general impression of the prevalence of smog and air pollution in those sections of Europe I happened to visit was that their problems are in general greater than ours. Since European industrial areas and city areas are more physically congested than ours, it is logical that smog and pollution would tend to be worse than that we experience. The Ruhr Valley is a good example of industrial air pollution that is excessive by any standard and that looks to be quite uncontrolled.

There is also a considerable awareness of this fact, as examples of articles in the press indicate. The *FRANKFURTER ALLGEMEINE ZEITUNG*, a highly respected German paper, carried a well-written article on smog from automobiles, including a summary of the latest California developments. Another article on smog from a daily paper in Milan, *CORRIERE LOMBARDO*, was a little bit more sensational in its treatment of smog and the automobile and called for action now. These are but two examples that I happened on, and are by no means isolated cases.

SUMMARY

1. A general expression of interest in receiving the material from our Lead Information Program was expressed by all four of the trade association offices visited. This material will be made available as it is developed here. Details involving distribution, number of copies and costs will be worked out as we go along.

-3-

2. The increased interest found in our health and safety activities by our European counterparts has been engendered by an increasing activity on the part of the general public, the press, the government and interested medical people in investigating potential adverse effects of lead. Therefore, it would seem to be in our common interest to work along these lines with our friends everywhere.

3. Special emphasis should be placed in these activities on the safe use of lead in industry, in order to help stem the potential decline in lead usage, and to provide a positive attitude on the part of industry toward new and increased use of lead.

For instance, in the automobile industry, we propose to work through interested trade associations, and disseminate pertinent engineering and medical information on the control of potential lead hazards. A start has been made, and such information is being sent to the IFA in London.

4. Smog control and other activities relating to air pollution in Europe should be followed, and concerted action should be taken where necessary to combat allegations of lead's contribution to air pollution, and to provide such information to trade associations and others as seems necessary.

ITALY

Istituto Italiano del Piombo e dello Zinco
Dr. Elemer Varady

Lead usage in automobile production here is at a minimum and appears to be diminishing every year. For instance, only Maserati and Ferrari useterne plate for gasoline tanks; all others are using galvanized steel. Auto body solder usage is also diminishing, and wherever possible stampings are being designed so that solder is not needed.

TEL usage and production are increasing, although problems are being reported and experienced from poisonings in manufacturing plants. This is apparently due to inexperience on the part of manufacturers. Several reports have appeared in the press of poisonings among the general population living adjacent to TEL manufacturing facilities. My schedule did not permit visits to any of these facilities. An instance of the concern felt here about lead in gasoline is the fact that warning signs are not posted on gasoline pumps as they are in America and most other places. Dr. Varady said that manufacturers in Italy feel there is nothing to be gained by pointing out to the public, through signs on every pump, that gasoline contains lead.

The use of lead stabilizers in plastics is increasing and Dr. Varady reported that one company alone is producing 500 tons per year, for which the main market is plastic cable sheathing. There appear to be no restrictions on the use of lead stabilizers for potable water piping, but this is academic since there is little or no market here at the present time. Among other lead stabilizer usage of note is in the plastic housings for out-board motors.

The first subway in Milan will start operating on November 1 but will use rubber-tired cars, and Dr. Varady anticipates no demand for lead asbestos anti-vibration pads due to its operation.

-4-

I asked Dr. Varady if he had received any comments about the recent Italian report of animal tests linking lung cancer with the use of galvanized water pipes. This report has been given wide publicity throughout the world. Dr. Varady is of the opinion that no action should be taken at this time by the industry to combat this publicity.

Dr. Varady is interested in receiving from us material developed under our Lead Information Program and wishes to participate in its distribution in Italy, although he feels that Italy is not ready as yet for a widespread dissemination.

Fiat, Mirafiori Plant, Turin

Persons contacted: Mr. Strazzeri, Export Department, who acted as translator
Mr. Chelka, Plant Engineering Department
Professor Briggati, Chief Medical Officer

This is a large, very well organized and operated automobile manufacturing plant that has been here for 65 years, and which has a current production capacity of 3000 cars per day.

Auto body solder is sparingly used at four places on larger bodies only. Sixty percent of their production uses no body solder. The solder used is a 60/40 Pb-Sn and when I asked why such an expensive alloy is used they explained to me that Professor Briggati had conducted a feeding experiment on dogs and had proved that less poisoning occurred in the dogs when the low lead solder was used. I realized it would be fruitless to point out the fact that men who use these solders do not eat them, and that our American experience with solders containing 96-98 percent lead has been quite satisfactory in every respect.

Bar solder is used for filling and repairing in body production. Finishing of such areas is by hand filing only. There is obviously no hazard here to the workers and no engineering control measures are needed. No solder is used in the electrical wiring system; mechanical clips and posts serve. There is one other production lead application and that is the dipping of the full-flow oil filter element in solder before it is assembled.

In a discussion with their engineer about body production I learned that they use a method whereby long seams, which are commonly filled with solder in American auto production, are instead turned out, the edges crisped, spot welded and then covered with decorative trim as part of the design. This is a neat way for getting around the use of lead, but in the opinion of American engineers it is a more expensive method, and has the added disadvantage that it restricts the body designer too much.

Medical -- In spite of the fact that there is no real lead hazard in this plant, Professor Briggati's department conducts a full and continuous surveillance of the men by testing each worker every three months with a urinary porphyrin examination. On occasion their laboratory also makes quantitative tests for lead in blood and urine, but Professor Briggati does not regard the blood test as a satisfactory indicator. He feels porphyrins are a more sensitive measure of the lead hazard. All lead workers are given vitamin-fortified milk at nine o'clock in the morning daily. Formerly all were given EDTA tablets, but this has recently been stopped.

The medical program here is much like that which we found in other European industry, that is, placing undue stress on diagnosis and treatment of disease, rather than emphasizing prevention.

14th Salone Internazionale dell Tecnica, Turin

I visited this trade exposition for the metal and related industries and was greatly impressed at its size, arrangement and general aesthetic appeal. The Expositione, their exhibit hall, is at least as large as Cobo Hall in Detroit, is very modern and much more tastefully arranged for both exhibitors and those in attendance. For instance, there is a moving sidewalk of at least a quarter of a mile in length to spare excessive walking. Many American manufacturers including IBM, DuPont, Minneapolis Honeywell, exhibit here along with European firms such as Pirelli and CEAT.

GERMANY

Elektroberufung E.V., Dusseldorf
Dipl.-Ing. Heuser

Herr Heuser is well informed about health hazards and public health allegations in Germany. He maintains contact with Professor Kauman at the University of Berlin, who is an expert in the field and has helped him in the past. There are no restrictions in Germany on the use of lead stabilizers in plastic piping, although the market is not a very large one at the present time. Lead pigments are not permitted in paints used on the interior of houses and apartments. Hartz, a town here, has passed an ordinance prohibiting lead in water pipes, but others have not yet followed with similar restrictions. There is no terne plate made in Germany. The first TEL plant is under construction and should be in production in about a year or so.

Herr Heuser feels that our Lead Information Program will be of value to him and he plans to distribute such material rather widely. For instance, he will consider sending copies of the Lettering Abstracts to some sixty or seventy health departments in cities and the federal government. Such distribution will depend on the initial reaction that is made to the material when it arrives.

All German automobile production facilities use body solder, with the exception of Volkswagen; and I understand that the Opel and Ford plants use the solder in much the same way as we do in America.

Volkswagen Werke, Wolfsburg
Persons contacted: Rudi Maletz, Public Relations
Mr. Moenck, Technical Translator

This plant is the largest single automobile manufacturing facility in the world today, having 50,000 employees, and a plant that is one-mile long under one roof. It has a capacity of one and a half million cars per year. It is the most highly automated automobile plant I have ever seen, with practically all material handling by conveyor systems, using automated and controlled transfer points throughout. Very few in-plant trucks are used and none outside the plant. All raw material is brought into the plant by rail or barge, and 90 percent of the finished products are shipped out of here by rail. A supply of raw materials sufficient for three months' production is kept here at all times.

There is no lead used in production of these cars in any way.

They are using a water-dispersed paint for the body prime coat and the body is dipped completely. This would be a good place for our new lead pigments, but they assured me there was no lead in this paint. Even so all workers in this

-6-

department are given a daily quart of milk. In the finish coat department they proudly showed as the first successful application in the automobile industry of automatic electrostatic paint spray for the complete body.

This plant is a wonder of the industrial world and is undoubtedly the most modern and most efficient production facility of its kind now in existence.

FRANCE

Centre D'Information du Plomb, 10 Place Vendôme, Paris 1^{er}
M. J.P. Chauvin

M. Chauvin has been made forcibly aware this past year of lead poisoning allegations by a recent government action ordering a ban on the use of lead in water pipes. He has an associate who is working full-time on this problem and feels that they will eventually be successful in lifting this ban.

He has an interest in our Lead Information Program although he feels at this time it would not be wise to make a wide distribution of the Kettering Abstracts on lead toxicology. He would prefer to make a small initial trial of the material and gauge French reaction to it.

We held a conference with two French physicians--Docteur Meininger, who is medical consultant to Penarroya, and Professeur Boudene, of the University of Paris. These men are well informed and are conversant with our American medical procedures for lead hazard control, although both of them disagree fundamentally with Dr. Kehoe's approach to the use of blood lead determinations, and feel that many cases of poisonings would be missed by the use of the Kehoe criteria. Specifically they claim to have seen several cases of poisoning where blood values were in the order of 60 micrograms/100g; Kehoe states that no poisonings occur under 80 micrograms/100g.

White lead carbonate is not allowed in paint by law in France although considerable amounts are still used for other purposes. Plastic pipes stabilized with lead are used although there are government regulations covering this use which have not been qualified sufficiently. Even with the ban on lead in water pipes previously mentioned, a considerable increase in lead tonnage for piping occurred last year.

Octel, 8 Rue Bellini, Paris 16^e (TEL producer)
M. Michel Hedde

M. Hedde is well informed regarding air pollution in Paris and the rest of France, and feels that in general there is not an acute problem at the present time. The governmental units having jurisdiction are active and appear to be well informed; they have made no special studies of lead in the atmosphere, and have none planned. There is a government air pollution committee and a Sub-committee on the Automobile, which is called UTAC, under the direction of M. Chapoux, 19 Rue Marcel Bonnet, Clichon-Seine, Paris. There is also a well-informed toxicologist, Professeur Henri Moureu, who is directeur de Laboratoire Municipal Ville de Paris, 33 bis rue de Dantzig, Paris 15^e. I did not meet either of these gentlemen, but M. Hedde offered to arrange a conference with them at some future date. These laboratories conduct continuous surveillance of the air in large cities with a special attention being paid to Paris, which contains 20 percent of France's people and cars. So far they find carbon monoxide to be of the utmost importance and the concentration of CO is increasing regularly. In some districts their tests show CO values of 60 parts per million and higher.

-7-

Copies of our SRI reports on lead in the atmosphere were sent to M. Hedde at his request.

Renault, Inc., Billancourt, Seine

Persons contacted: Docteur Magri, responsible for hygiene industrielle
Monsieur Guyotjeannin, Toxicologist

I was accompanied on this visit by Monsieur Chauvin who performed a very necessary translating service. This plant is one of the largest automobile manufacturing plants in France and is wholly government owned and operated. It has a plant population of 35,000 employees (including one American, an Apache Indian named Kennedy).

There is very little auto-body solder used in production here, most of it being used for repair on the production line. When this occurs the excess solder is filed off by hand, thus creating no lead hazard. No special control measures are used or needed. However, I was able to see most of the other production uses of lead in this plant; and these occur at radiator soldering, electrical connection soldering, by means of dipping the wires in a lead bath at 350°C, which is similar to much of our American practice, gas tank manufacturing fromterne, and one or two small miscellaneous jobs, such as dipping the end of the battery cable in a lead bath. All of these operations were conducted with good engineering controls, and usually with excellent local exhaust ventilation, some of which is more sophisticated and of greater complexity than that used in American plants. For instance, I saw a very small exhaust ventilation unit piped to a spot welder which was tacking support brackets on to the gas tank. This is a refinement that we would not consider necessary.

They use no lead in their paints. They make their own primer which is a black enamel type into which the whole body is dipped. This creates quite a fire hazard, and I asked them if they would be interested in a water-dispersed, lead-containing paint for this job, but they explained to me that this would be impossible due to the fact that they dry sand this primer before the final top coats are placed on the body. I saw this job and agree.

In summary, the plant appears to be very well operated and their potential lead hazards are under excellent engineering control.

Medical -- Their medical department has twenty-five full-time physicians plus a full-time toxicologist, and a laboratory. There are 150 employees who have some sort of lead exposure and who are monitored and tested with an excessive thoroughness. Lead-exposed employees are given blood stipple-cell tests, quantitative lead in urine and blood, red cell counts, tests of delta-aminolevulinic acid in urine and urinary coproporphyrins. All of the above tests are given to each employee as part of his pre-employment examination and from then on at two-month intervals, until six months have elapsed, and then every six months thereafter. Not all of the tests are given on a routine basis but they feel that the delta-aminolevulinic acid in urine is the best test. Incidentally, for their lead in blood evaluation they use 80 micrograms percent as a judgment criterion, just as we do. In addition they have a test of their own devising, and of which they are very proud. This consists of soaking an employee's hands at the end of the shift in a weak solution of acetic acid, and then analysing the solution for its lead content. These results are carefully tabulated, records are kept of them, and I was assured that they are very useful. They also perform lead in air evaluations but not on a routine basis.

-8-

There has not been a case of lead poisoning since 1952 in this plant, and I am certain that it is because there is no real exposure to lead here. I was told by Dr. Megri that most of their lead exposure comes from eating and smoking and not from the atmosphere. However, lead is not of great concern to them. They are much more concerned about the solvent hazards in their plant. After seeing the extensive body primer dip tanks I am rather inclined to agree.

ENGLAND

Lead Development Association, London

Persons contacted: Messrs. Morgan Davies
Harry Wesson
Robert Smith
Ross Stubbs

The LDA is quite interested in making use of the material that we are producing under our Lead Information Program. We plan to start distribution of the Kettering Abstracts on Lead Toxicology here at the same time as our American distribution is initiated.

There are recent and continuing allegations made in the press about lead poisonings in industry and elsewhere. For instance, a recent medical journal has published an article about childhood poisonings, the nature of which is similar to those which we experience in our country. There appears to be a great use for positive material on lead toxicology in this country.

During my visit in England I was given invaluable assistance by Mr. Morgan Davies and the other mentioned members of his Staff.

Vauxhall Motors Ltd., (General Motors) Luton

Persons contacted: Dr. Thompson, Chief Medical Officer
Dr. de Kretser, Assistant Medical Officer
Mr. Waldron, Laboratory Technician

This is a good-sized automobile plant employing 22,000 people and which in most respects I found familiar, since it is operated in much the same manner as an American plant, and looks very much like an American plant. The big difference is the slow pace at which they operate here, production being about half the rate of our plants.

Body solder is used in about the same extent as we use it, although I think they get by with a little bit less per car, mainly because they seem to be more careful in their manufacturing processes, and therefore do not need to fill up as many holes and cracks.

Solder grinding booths are used, and these are based partly on American design, although they are much smaller than we find necessary, being not over four body lengths in size, and being operated with four to six men in a booth. Each booth was ventilated by means of a down-draft ventilation system which works out to be quite costly. I am obtaining, for these people and others who are interested, representative prints of the latest American designs for such facilities. Our designs represent a cost of not more than 15 or 20 percent of theirs.

-9-

The lead operation here is distinguished by the lack of a reasonable and enforceable control program. Their great concern with medical diagnosis and treatment procedures seems to mitigate against better engineering control. This is reflected in the laxity with which all employees regard safety precautions. For instance, here, as elsewhere in England, I observed the foreman, other employees, and even the doctor walk into the solder grinding booth without wearing a respirator, or without being the least bit concerned.

Medical -- There are 600 men exposed to lead, and all are routinely checked for hemoglobin count, stipple-cell count, qualitative urinary coproporphyrins. Their laboratory is not equipped to do routine lead in blood or urine, but they have performed these analyses on occasion. However, they do not feel these tests are needed. Each man is given one quart of milk a day, even though Dr. Thompson does not feel it is necessary. Every man is checked by the laboratory at least every three months, and Dr. Thompson says he has not seen a case of lead poisoning in eight or nine years.

Pressed Steel, Oxford, Cowley

Persons contacted: Mr. M. S. Boggon, Research Engineering
Dr. W. Reynard, Chief Medical Officer

This is a very large plant devoted wholly to the manufacture of automobile bodies for a number of auto makers including Jaguar, Rolls-Royce, and British Motors Corporation. There are 11,000 employees at this plant, and total employment is 20,000 in three plants. There are 800 employees in this plant exposed to lead.

I was told that lead control has been greatly improved over the past ten years by the installation of solder grinding booths patterned after American design. However, control of the lead hazard on the whole is very poor, due largely to the lack of control of their employees who disregard safety precautions anywhere, and on all possible occasions. The solder grinding booths are fairly well designed, but lack the important refinements that we have found to be necessary. For example, we believe in exhausting more air per booth. I will make available up-to-date prints and specifications for solder grinding booths.

The amount of lead used on some of the car bodies is very high, ranging from about 90-100 pounds per body for the Rolls-Royce, to 30-35 pounds per body for the Jaguar, and zero for a new model being made for British Motors Corporation.

Among the points discussed with their management (Mr. Boggon has been assigned the job of providing engineering control measures for the lead operation) is the fact that employees ignore the use of respirators; solder grinding takes place outside of the booth area, exposing everyone in the plant to lead dust; any employee can and does walk into the solder grinding booth without respiratory protection; and in general a total lack of control of employees by management. When this last item was discussed with management they enlarged on the difficulty of working with union men.

Before the serious lead hazard here can be controlled, appropriate engineering of the operations will have to be made and installed, management must explain to employees the reasons for the engineering control measures and enlist their cooperation, and a sound medical program will have to be provided.

Medical -- The lead-exposed employees are given stipple-cell counts, urinary coproporphyrin tests, hemoglobin counts and blood pressure measurements. Dr. Reynard sees thirty men per day and thus keeps up a continuous surveillance. With these

-10-

methods of surveillance I would expect it to be impossible to operate a lead control program, and such is admitted to be the case by Dr. Reynard and his management. It is obvious that the employees also are aware of this situation. So far this year two solder grinding booth employees have died--one from hypertension and one from peritonitis following constipation and perforation of the bowel. The employees evidently believe these were lead poisoning cases even though the compensation courts' rulings were indeterminate. A great deal of publicity in the local press was given to these two cases.

We learned from other automobile plant medical officers that Dr. Reynard had become so upset about the two deaths in his plant that he had called a meeting of automobile plant physicians and seriously proposed that each of them agree to ban all use of lead in automobile body manufacturing in England. Needless to say, his proposal was not seconded by any of the others.

Ford Motor Company, Dagenham

Persons contacted: Dr. Cressal, Medical Officer
D. E. Hickish, Industrial Hygienist
M. E. Stagg, Plant engineering
Mr. Battison, Plant Manager

This plant again strongly reminds one of an American automobile manufacturing facility, but is operated at about half the production rate common to our plants. This is probably what keeps them from having more trouble with lead.

They use body solder in about the same amounts and in the same way that we do in our plants, although they express a strong desire to design the need for lead out of their manufacturing process. The design of their solder grinding booths is a poor imitation of our American booths and is quite inadequate. This inadequacy apparently is known to their engineering staff for Mr. Stagg discussed with us his plans for a new grinding booth of excessively sophisticated design which would be very costly. I pointed out to him our reasons for simplifying the design, quoted him some comparative cost figures, and he seemed to be very much interested in having the benefit of our recent engineering developments. I plan to send him a set of American prints for these facilities. Here also safety precautions are ignored universally; solder grinding takes place anywhere the employee wishes to perform the operation, and anyone may enter or leave the solder grinding booth at will.

After our plant tour and visit Mr. Battison requested a conference with us; and we outlined for him briefly our thoughts in the matter of lead control. He was most interested when we pointed out the fact that a good control program is an efficient control program, reduces costs and will take away from the employee his chance of being exposed to excessive amounts of lead.

Medical -- Here again we find the European approach to lead control--placing excessive emphasis on diagnosis and treatment rather than prevention. Stipple-cell counts and urinary coproporphyrins are the sole means used for gauging lead absorption here. Dr. Cressal was most interested in hearing about our methods which involve a single determination of lead in the blood.

Huntingdon Research Centre, Huntingdon
Alastair W. Worden, Director

This laboratory is one of the largest of its kind in Europe and is engaged in toxicology and pharmacology research. Dr. Worden is interested in expanding into

-11-

service to industry with a program for blood lead analysis. Since there is no laboratory in England at the present time equipped for this analysis we felt it advisable to talk to them and give them whatever assistance we can.

Dr. Worden is concerned about whether or not there would be a demand for the blood lead service if he should make the necessary investment and obtain the equipment needed. It is our opinion, and that of the LDA, that this would be an excellent way in which to provide this service for England and possibly the Continent. Dr. Worden understands our view that European methods for measuring lead absorption are 20-50 years behind the times, and that until blood lead analyses are made available to industry there is a strong possibility that industrial lead hazards will remain prevalent and out of control.

Warren Spring Laboratory, Gumpels Wood Road, Stevenage, Herts
 Persons contacted: Dr. C. C. Hall, Director
 Dr. Robinson, Assistant Director
 Dr. Reed, Air Pollution
 Mr. Sharpe, Air Pollution

This is a large government laboratory presently engaged in research in a number of areas of science. Our interest was in the air pollution evaluation program which the laboratory is at present carrying on officially for the British government.

This evaluation is in many respects similar to that which our U. S. Public Health Service conducts in America at the present time. Air samples are taken daily at 1100 separate monitoring stations in selected areas throughout the British Isles. Routine measurements of total particulates plus SO_2 are made. As might be expected some of their particulate measures are very high; in the range of 200 to 400 micrograms per cubic meters of air.

I was impressed with their competence and energy and the extensive program which they are operating. For instance, they are sampling from a greater number of stations in their small country than we are in our large country, and the results are continuously programmed into a computer for quick read out and presentation.

At the present time they are convinced that lead in the air is not a public health problem and they are not measuring it. We saw no lead data although Mr. Davies is attempting to obtain copies of whatever data they have on lead.

Mr. Elliot Philipp, 94 Harley Street, London

Mr. Philipp is a local obstetrician who had requested funds for a lead study from the LDA. Mr. Davies and I met with him to discuss his proposal. Since Mr. Philipp is a respected member of his profession and made an earnest approach to us we felt it would be well to have this conference with him.

As a result of his observations during his practice at the Oldchurch Hospital located in a low socio-economic area near industrial districts, he gained the impression that lead workers and their children suffered a greater number of abortions, stillbirths and physical anomalies. We learned that Mr. Philipp has no data to support his conclusion and we were able to point out to him that even if a study of these birth defects were desirable, the difficulty in setting up a scientific evaluation would be insuperable. Mr. Philipp finally

-12-

agreed with us that valid results would be almost impossible to obtain in any practical size group of men and women, and that it would be advisable to postpone consideration of any project until practical means of arriving at answers can be found.

Don G. Fowler
Don G. Fowler

DGF:md