CHRONIC HAZARDS LABELING LEGISLATION

HEARINGS

BEFORE THE

SUBCOMMITTEE ON CONSUMER PROTECTION AND FINANCE

OF THE

COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE HOUSE OF REPRESENTATIVES

NINETY-SIXTH CONGRESS

SECOND SESSION

ON

H.R. 6977

A BILL TO AMEND THE FEDERAL HAZARDOUS SUBSTANCES ACT TO ESTABLISH LABELING REQUIREMENTS APPLICABLE TO SUBSTANCES WHICH CAUSE CHRONIC HEALTH SIDE EFFECTS, AND FOR OTHER PURPOSES

SEPTEMBER 16 AND 17, 1980

Serial No. 96–217

Printed for the use of the
Committee on Interstate and Foreign Commerce

U.S. GOVERNMENT PRINTING OFFICE
70-237 O WASHINGTON : 1980

COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE

HARLEY O. STAGGERS, West Virginia, *Chairman*

JOHN D. DINGELL, Michigan
LIONEL VAN DEERLIN, California
JOHN M. MURPHY, New York
DAVID E. SATTERFIELD III, Virginia
BOB ECKHARDT, Texas
RICHARDSON PREYER, North Carolina
JAMES H. SCHEUER, New York
RICHARD L. OTTINGER, New York
HENRY A. WAXMAN, California
TIMOTHY E. WIRTH, Colorado
PHILIP R. SHARP, Indiana
JAMES J. FLORIO, New Jersey
ANTHONY TOBY MOFFETT, Connecticut
JIM SANTINI, Nevada
ANDREW MAGUIRE, New Jersey
EDWARD J. MARKEY, Massachusetts
THOMAS A. LUKEN, Ohio
DOUG WALGREN, Pennsylvania
ALBERT GORE, JR., Tennessee
BARBARA A. MIKULSKI, Maryland
RONALD M. MOTTL, Ohio
PHIL GRAMM, Texas
AL SWIFT, Washington
MICKEY LELAND, Texas
RICHARD C. SHELBY, Alabama
ROBERT T. MATSUI, California
JAMES T. BROYHILL, North Carolina
SAMUEL L. DEVINE, Ohio
TIM LEE CARTER, Kentucky
CLARENCE J. BROWN, Ohio
JAMES M. COLLINS, Texas
NORMAN F. LENT, New York
EDWARD R. MADIGAN, Illinois
CARLOS J. MOORHEAD, California
MATTHEW J. RINALDO, New Jersey
DAVE STOCKMAN, Michigan
MARC L. MARKS, Pennsylvania
TOM CORCORAN, Illinois
GARY A. LEE, New York
TOM LOEFFLER, Texas
WILLIAM E. DANNEMEYER, California

KENNETH J. PAINTER, *Chief Clerk and Staff Director*
ELEANOR A. DINKINS, *First Assistant Clerk*
JOHN H. ALLEN, *Professional Staff*
NANCY ANN NORD, *Associate Minority Counsel*

SUBCOMMITTEE ON CONSUMER PROTECTION AND FINANCE

JAMES H. SCHEUER, New York, *Chairman*

RICHARDSON PREYER, North Carolina
RICHARD L. OTTINGER, New York
DAVID E. SATTERFIELD III, Virginia
THOMAS A. LUKEN, Ohio
HARLEY O. STAGGERS, West Virginia
(Ex Officio)
MATTHEW J. RINALDO, New Jersey
SAMUEL L. DEVINE, Ohio
JAMES T. BROYHILL, North Carolina
(Ex Officio)

EDMOND F. ROVNER, *Staff Director*
JOHN P. MCLAUGHLIN, *Counsel*
MARGARET A. DURBIN, *Minority Staff Assistant*

CONTENTS

ORGANIZATIONS REPRESENTED AT HEARINGS

Boston Visual Artists Union, Shirley Levy, member, executive board.
College Art Association, Albert E. Elsen, president.
Consumer Product Safety Commission:
King, Susan B., Chairman.
Krulwich, Andrew, General Counsel.
Lemberg, Steven, Associate General Counsel.
Preuss, Peter, Director, Health Sciences.
White, Paul, Commission Staff Scientist.
Crayon, Watercolor & Craft Institute, Leonard J. Goldwater, M.D., toxicology consultant.
National Art Materials Trade Association, Howard L. Landstrom, executive director.
National Ceramic Manufacturers Association, Milan Vukovich, Jr.
National Paint & Coatings Association:
Hurd, Patrick J., industrial hygienist.
Johnson, Frederick F., manager.
Young, Hugh F., Jr., legislative counsel.

CHRONIC HAZARDS LABELING LEGISLATION

TUESDAY, SEPTEMBER 16, 1980

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON CONSUMER PROTECTION AND FINANCE,
COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE,
Washington, D.C.

The subcommittee met, pursuant to notice, at 1:30 p.m., in room 2322, Rayburn House Office Building, Hon. James H. Scheuer, chairman, presiding.

Mr. SCHEUER. The Subcommittee on Consumer Protection and Finance will be in order.

I want to apologize for the delay, but as you know, those of you who have heard the bells, we have had a long series of rollcall votes.

We are commencing hearings on H.R. 6977, the Chronic Hazards Labeling Act that was introduced by Congressman Fred Richmond.

During these first two sessions, we will focus on the potential hazards to consumers arising from the use of various chemicals and arts and crafts materials. These are used by somewhere between 27 and 42 million people, approximately $1.7 billion or $1.8 billion is spent on these materials every year, so that an enormous percentage of the population is exposed. We are especially concerned with the fact that many of these products are used by kids who are more susceptible to chemical damage to their systems because, a, they don't know how to use these things, these products, they don't know how to take protective steps. And b, they are in the formative stages of their bodily growth, and they are most at risk to the damages of toxic chemicals.

Now, the purpose of H.R. 6977 is to alert consumers as to the potential product health effects, side effects of certain consumer products, as well as to advise them on various precautionary measures that can be taken to reduce their exposure to such substances and to reduce or eliminate the resultant hazard by the taking of intelligent precautions.

In effect, the legislation would require that if specified, national, or international organizations determined that a compound could cause cancer, then it would be labled "Warning: This chemical has been shown to cause cancer in humans and animals."

If the compound is proven by opinion of the Consumer Product Safety Commission to pose reproductive, genetic, or neurologic hazards, or other product hazards, then the Commission could require labeling that describes the health-affecting compound as well as procedures which may be followed to counteract or reduce these health side effects.

Without objection the text of H.R. 6977 will be printed at this point in the record.

[Testimony resumes on p. 12.]

[The text of H.R. 6977 follows:]

[H.R. 6977, introduced by Mr. Richmond on March 31, 1980.

Cosponsored on June 26, 1980, by:
Mr. Barnes, Mr. Phillip Burton, Mr. Conyers, Mr. Corrada, Mr. Gray, Mr. Guarini, Mr. Leyman, Mr. Mitchell of Maryland, Mr. Moakley, Mr. Seiberling, Mr. Solarz, Mrs. Spellman, Mr. Stark, Mr. Stokes, Mr. Vento, Mr. Walgren, Mr. Waxman, Mr. Weiss, and Mr. Wolff;

Cosponsored on September 3, 1980, by:
Mr. Drinan;

Cosponsored on September 5, 1980, by:
Mr. Green,

is as follows:]

A BILL

To amend the Federal Hazardous Substances Act to establish labeling requirements applicable to substances which cause chronic health side effects, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section 2(f)(1) of the Federal Hazardous Substances Act (15 U.S.C. 1261(f)(1)) is amended by adding at the end thereof the following new clauses:

"(E)(i) Any substance or mixture of substances which possesses chronic toxicity (as defined in paragraph (g)(2)(A)), if such substance or mixture is capable

of being ingested, inhaled, or absorbed into the human body through any customary or reasonably foreseeable handling, use, or misuse (including any reasonably foreseeable handling, use, or misuse by children).

"(ii) The Consumer Product Safety Commission shall have the authority to issue regulations, in accordance with the procedures prescribed in section 553 of title 5, United States Code, which provide that any particular substance or mixture of substances shall not be classified as a hazardous substance under subclause (i) if the Commission determines that such substance or mixture does not present any risk to humans if such substance or mixture is ingested, inhaled, or absorbed into the human body through any customary or reasonably foreseeable handling, use, or misuse (including any reasonably foreseeable handling, use, or misuse by children).

"(F) Any substance or mixture of substances which the Consumer Product Safety Commission determines, in accordance with the procedures prescribed in section 553 of title 5, United States Code, or in accordance with the procedures established in section 3(a), to possess chronic toxicity (as defined in clause (B), clause (C), or clause (D) of paragraph (g)(2)), except that a substance or mixture shall not be consid-

ered to be a hazardous substance under this clause unless such substance or mixture is capable of being ingested, inhaled, or absorbed into the human body through any customary or reasonably foreseeable handling, use, or misuse (including any reasonably foreseeable handling, use, or misuse by children).

"(G) Any substance or mixture of substances which—

"(i) possesses chronic toxicity, as defined in subclause (A), subclause (B), or subclause (C) of paragraph (g)(2), or as determined under subclause (D) of paragraph (g)(2); and

"(ii) is present as a contaminant in any household substance or mixture of household substances;

if the Consumer Product Safety Commission determines, in accordance with the procedures prescribed in section 553 of title 5, United States Code, or in accordance with the procedures established in section 3(a), that such substance or mixture is capable of being ingested, inhaled, or absorbed into the human body through any customary or reasonably foreseeable handling, use, or misuse (including any reasonably foreseeable handling, use, or misuse by children).".

SEC. 2. Section 2(g) of the Federal Hazardous Substances Act (15 U.S.C. 1261(g)) is amended—

(1) by inserting "(1)" after the paragraph designation;

(2) by inserting ", and to any substance which possesses chronic toxicity" after "body surface"; and

(3) by adding at the end thereof the following new subparagraph:

"(2) For purposes of this paragraph, substances which possess chronic toxicity include the following:

"(A) Any substance which causes tumors or cancer (or which is metabolized to a substance which causes tumors or cancer) in humans or other mammals, including—

"(i) any substance which—

"(I) the Secretary of Health and Human Services (or the head of any bureau, administration, or other organizational unit in the Department of Health and Human Services); or

"(II) the International Agency for Research on Cancer;

reviews and determines to cause tumors or cancer in humans or other mammals, if any

such determination is based upon valid studies and procedures; and

"(ii) any substance which is regulated by the Environmental Protection Agency, the Food and Drug Administration, or the Occupational Safety and Health Administration as the result of a determination that such substance causes tumors or cancer in humans or other mammals, if any such determination is based upon valid studies and procedures.

"(B)(i) Any substance which causes any adverse reproductive effect or any adverse genetic effect.

"(ii) For purposes of this clause, adverse reproductive effects and adverse genetic effects include any birth defect, toxicity to a fetus, sterility or impaired reproductive capacity, spontaneous abortion, any mutagenic effect, and any damage to genetic material.

"(iii) Any determination of the Consumer Product Safety Commission that a substance causes any adverse reproductive effect or any adverse genetic effect shall be based upon valid studies and procedures. Such studies and proce-

dures may include the use of human subjects, experimental animals, microorganisms, culture cells, or other test systems.

"(C)(i) Any substance which causes any adverse effect upon the central nervous system or any peripheral nervous system.

"(ii) Any determination of the Consumer Product Safety Commission that a substance causes any adverse effect upon the central nervous system or any peripheral nervous system shall be based upon valid studies and procedures. Such studies and procedures may include the use of human subjects, experimental animals, or other test systems.

"(D) Any substance which the Consumer Product Safety Commission determines (in accordance with the procedures prescribed in section 553 of title 5, United States Code, or in accordance with the procedures established in section 3(a)) to possess any form of chronic toxicity, other than those forms of chronic toxicity specified in clause (A), clause (B), or clause (C), if such substance or mixture is capable of being ingested, inhaled, or absorbed into the human body through any customary or reasonably foreseeable handling,

use, or misuse (including any reasonably foreseeable handling, use, or misuse by children).".

SEC. 3. Section 2(p) of the Federal Hazardous Substances Act (15 U.S.C. 1261(p)) is amended—

(1) in subparagraph (1) thereof—

(A) by inserting ", in the case of any substance other than any substance or mixture of substances which is defined as a hazardous substance under clause (E) or clause (G) of paragraph (f)(1) and other than any substance which possesses chronic toxicity (as defined in paragraph (g)(2)(A))," after "(1) which"; and

(B) by adding at the end thereof the following: "(K) in the case of any hazardous substance which causes any physical side effect, a statement which describes the nature of such side effect and explains procedures which may be followed to counteract such side effect;";

(2) in subparagraph (1)(I) thereof—

(A) by striking out "and storage" and inserting in lieu thereof ", storage, and disposal"; and

(B) by striking out "or storage; and" and inserting in lieu thereof ", storage, or disposal;"; and

(3) by redesignating subparagraph (2) as subparagraph (3), and by inserting after subparagraph (1) the following new subparagraph:

"(2) which, in the case of any substance or mixture of substances which is defined as a hazardous substance under clause (E) or clause (G) of paragraph (f)(1) and which possesses chronic toxicity (as defined in paragraph (g)(2)(A)), states conspicuously (A) the information required in clause (A), clause (B), and clause (I) of subparagraph (1); (B) the phrase 'WARNING: HAS BEEN SHOWN TO CAUSE CANCER IN ANIMALS' on any substance which has been determined to possess chronic toxicity (as defined in paragraph (g)(2)(A)), based upon any valid study or procedure using experimental animals; (C) the phrase 'WARNING: HAS BEEN SHOWN TO CAUSE CANCER IN HUMANS' on any substance which has been determined to possess chronic toxicity (as defined in paragraph (g)(2)(A)), based upon any valid study or procedure using human subjects; and (D) precautionary measures which describe actions to be followed and actions to be avoided in connection with any use of the substance; and".

SEC. 4. Section 20(a)(1)(A) of the Federal Hazardous Substances Act (15 U.S.C. 1275(a)(1)(A)) is amended—

(1) by inserting ", 2(p)(2)," after "sections 2(p)(1)";

(2) in clause (i) thereof, by inserting "and section 2(p)(2)(D)" after "section 2(p)(1)(F)";

(3) in clause (ii) thereof, by striking out "and" at the end thereof; and

(4) by adding at the end thereof the following new clause:

"(iv) instructions for procedures to counteract side effects under section 2(p)(1)(K); and".

SEC. 5. The amendments made in the foregoing provisions of this Act shall take effect at the end of the two-year period following the date of the enactment of this Act. The Consumer Product Safety Commission shall have authority to issue regulations (in accordance with the Federal Hazardous Substances Act, as amended by such foregoing provisions) during such two-year period for purposes of carrying out such amendments, except that the effective date of any such regulations shall not occur before the end of such two-year period.

Mr. SCHEUER. Our first witness today is Hon. Susan King, Chairman of the Consumer Product Safety Commission. After Chairman King, we will have several panels composed of doctors and the artists who use these many materials, and that should be an interesting followup to Chairman King's testimony.

Your full remarks will be appended in the record, Madam Chairman.

With that in mind, you may wish to chat informally about the legislation or read your prepared statement, as you will.

STATEMENT OF HON. SUSAN B. KING, CHAIRMAN, CONSUMER PRODUCT SAFETY COMMISSION, ACCOMPANIED BY ANDREW KRULWICH, GENERAL COUNSEL; STEVEN LEMBERG, ASSOCIATE GENERAL COUNSEL; DR. PETER PREUSS, DIRECTOR, HEALTH SCIENCES, AND PAUL WHITE, COMMISSION STAFF SCIENTIST

Ms. KING. Thank you very much, Mr. Chairman.

It is a pleasure to be here. If I might introduce our staff members who are accompanying me, on my right at the end of the table is Steven Lemberg, who is Associate General Counsel, Andrew Krulwich, to my right, who is General Counsel, on my left, Dr. Peter Preuss, who is our Director of Health Sciences, and to his left, Paul White, who is a Commission staff scientist.

I will try to abbreviate the testimony.

Mr. SCHEUER. Can you folks hear back there?

VOICES. No.

Ms. KING. As I said, I will try to go through the testimony, but abbreviate it as much as I can, with my understanding that the full testimony is incorporated into the record.

Mr. SCHEUER. Yes, it will be incorporated at this point.

Excuse me. Can you hear now in the back?

VOICES. Yes.

Ms. KING. You described the provisions of H.R. 6977 in summary, and we would like to say that the Commission supports this legislation. The bill would have the direct effect of giving consumers basic information on which purchasing decisions would be made, and would also encourage consumers to use products more safely.

Equally important, the bill would indirectly encourage manufacturers to adopt adequate substitutes for carcinogenic ingredients. Before commenting on the specifics in the bill, if I might, I would like to comment a little bit on labeling as a regulatory approach. Then I would like to discuss separately the two major aspects of the bill: First, that part which deals with carcinogens, which has an automatic triggering device, and second, that part of the bill which deals with other chronic hazards.

Attached to the testimony are several suggested changes in the bill and a section by section analysis. [See p. 19.]

Mr. SCHEUER. May I interrupt?

We are being joined by Congressman Matthew Rinaldo, the ranking minority member of the subcommittee.

Ms. KING. Good afternoon, Congressman.

Mr. SCHEUER. He is a very diligent and hardworking member.

Ms. KING. As authors of the Toxic Substances Control Act, members of this subcommittee do not need to be reminded of the nature

or dimension of the cancer problem in this country. Suffice it to say that it is a major health problem and, according to some experts, a growing one.

The chief concern of the Consumer Product Safety Commission in dealing with the threat of cancer is with chemicals that are present in consumer products. Today there are some 48,000 chemicals in use in the United States, of which perhaps as many as 10,000 are used in consumer products.

We recognize that there are substantial differences within the scientific community on many issues related to the cancer problem, such as how much cancer can be attributed to specific causes and how much can be prevented by controlling exposure to carcinogens. Notwithstanding this ongoing debate, the Congress in enacting statutes like the Toxic Substances Control Act and the Consumer Product Safety Act, and this subcommittee in considering legislation like H.R. 6977, clearly subscribe to the principle that we are better off safe than sorry. I agree with this principle, and I believe my colleagues at the Commission certainly agree with this as well.

Mr. SCHEUER. Let me just say as a footnote to that that there is no such thing as a risk to free society, and we never will have one. I think there is a perception on the part of the Congress that, while we all would rather be safe than sorry, still and all, there ought to be some kind of weighing of costs and benefits. We shouldn't impose costs on manufacturers that will be passed on to consumers unless there are clear benefits in excess of those costs that will be produced by the action.

In other words, we don't accept the principle that because it is better safe than sorry, we do everything that we can think of to regulate industry in terms of notice, in terms of add-ons to cost to the manufacturing process. There have to be reasonable parameters of the layers of protection that we add on. There has to be a clear showing that the benefits are clearly superior, in excess of the costs.

Ms. KING. We understand your position and the committee's position on that issue, and we have had rather extensive discussions with you about that.

Mr. SCHEUER. That is right.

Ms. KING. I think a bill such as this, which proposes labeling as a regulatory alternative, addresses that in a timely and cost-effective fashion, and to that end, we ask and the committee asks, of course, what role labeling can play in the Government's fight against cancer as well as other health hazards.

The CPSC has authority to regulate carcinogens in consumer products. We are currently studying approximately a dozen carcinogens or groups of chemically related carcinogens and are likely to recommend strong regulatory action, such as a ban, where necessary, to adequately protect the public. However, as you well know, rulemaking proceedings to regulate products containing hazardous chemicals are invariably quite protracted. In the interim, the consumer is afforded no protection.

We believe the bill's provisions for automatic labeling of products that contain intentionally added carcinogens will provide protection to consumers that they do not now have—both in instances where further regulatory action is necessary and those instances

70-237 O - 81 - 2

where it is not. We agree with the philosophy behind the bill that consumers have a right to know if a product contains a carcinogen so that they may make informed purchasing decisions.

As to what the labeling of chronic hazards will accomplish, I think there are a number of points to be made.

First, labeling will provide consumers with relevant information to consider when making their purchasing decisions. For some substances, additional work may be necessary before a decision can be made as to the need for other regulatory action. Until that decision is made, labeling would give the consumer information on which to make an informed choice.

Second, because of the potential impact on sales, the need to label products as a result of their chronic toxicity may create a strong incentive for manufacturers to reformulate their products without the carcinogens or to seek adequate or safe substitute ingredients.

Third, where reformulation is not possible, or where there are no substitutes that are feasible in terms of their cost, availability, and effect on the product's utility, the label would leave the choice to the consumer—at least until further regulatory action, if any, were to be taken.

Some consumers may choose not to buy the product based on the information provided in the label. Other consumers may ignore the label altogether, for whatever reason, and continue to buy and use the product as before. Still other consumers may continue to buy the product, but use it in a different manner so as to reduce their exposure to the ingredients of the product.

For example, persons using a liquid cleaning product containing a hazardous chemical that is absorbed through the skin might avoid of reduce the risk of exposure by wearing gloves and being careful not to splash themselves with the material. If inhalation is the source of the exposure, consumers could use the product outdoors or with a fan for ventilation. This presumes that the consumer would rather assume that reduced risk than stop using the product—again, a choice left to the consumer.

This goes very much to the point that you were making that if there are precautionary measures that can be taken, it is appropriate that such information be available.

I might note that labeling and other forms of required information disclosure have become more important regulatory tools in recent years. In a meeting with the Regulatory Council this June, and in a memorandum to the heads of all departments and agencies, President Carter directed the regulators to search for ways to achieve regulatory goals while reducing burdens in the private sector.

One of the regulatory alternatives and techniques that President Carter characterized as particularly promising was information disclosure.

We at the Commission have already found labeling and information disclosure to be a useful tool and have relied on it in a number of instances.

In summing up, I want to emphasize the point that labeling may be only an interim step in some cases. Under some circumstances, it will be necessary to take further regulatory action, such as a

ban. Yet, because of the enormous scope of the cancer problem and the complexity of the scientific and regulatory issues involved, it may be many years before we can complete our work on this agenda.

As to the provisions of the bill before the subcommittee, H.R. 6977, let me make a number of points.

The Federal Hazardous Substances Act, FHSA, provides for automatic labeling of toxic household products which can cause serious illness. For acutely toxic substances, as opposed to chronic substances, labeling is generally predicated on specified laboratory tests. However, although the FHSA provides authority to regulate chronic hazards, the act and its accompanying regulations do not provide any such simple test or definition to determine whether a household substance that presents a chronic hazard should be labeled.

Thus, at the present time, mandating labeling for chronic hazards must generally be accomplished by separate regulation for each substance involved.

The bill before us today, H.R. 6977, would close this gap in the FHSA by providing a general definition of chronic toxicity which would greatly expedite the process of providing relevant information to consumers about chronic hazards.

First, the bill provides for automatic labeling of household products that expose humans to intentionally added, identified human or animal carcinogenic ingredients, regardless of the level or concentration of carcinogens in these products.

Second, the bill provides for labeling, by regulation—not automatically, as in the previous case—of household substances that, one, cause adverse reproductive or genetic effects, or adverse effects on the central nervous system; or, two, that contain carcinogens as contaminants only.

Third, the bill provides for labeling, again by individual regulation, of household substances containing any other form of chronic toxicity.

The bill references three separate sources, outside the Commission, whose determination that a chemical is a carcinogen would be sufficient to require labeling of household substances containing a carcinogen and capable of exposing consumers to the carcinogen. The first source is the Department of Health and Human Services, which includes the National Cancer Institute, NCI.

For several years NCI has been publishing the results of its carcinogenicity bioassays of a wide range of chemicals. These bioassays are in their design large and more rigorous tests of carcinogenicity than most previous experiments in that field. After a bioassay is complete, NCI has a panel of experts, representing many different disciplines and interests, who decide whether the data generated are sufficient to judge the chemical carcinogenic.

The second expert source, the International Agency for Research on Cancer, IARC, has now published 22 monographs evaluating the data on carcinogenicity of several hundred compounds. IARC convenes a panel of about 15 international experts on carcinogenesis who review the existing worldwide data on the carcinogenicity of the compounds. IARC evaluations are widely accepted as the most

definitive judgments available for a very large number of chemicals.

The bill also references the Environmental Protection Agency, EPA, the Food and Drug Administration, FDA, and the Occupational Safety and Health Adminstration, OSHA, as additional sources for determining carcinogenicity. Each of these agencies has amassed considerable expertise in assessing the carcinogenicity of chemicals.

As to the first section of the bill, the scope of automatic labeling, we estimate that of the thousands of chemicals which are used in consumer products today, less than 2 dozen are identified carcinogens that may be subject to the automatic labeling provisions of H.R. 6977. However, a single substance might be used in hundreds of products. Therefore, although the number of chemicals affected by the automatic labeling provision is expected to be quite small, the number of products that would actually be labeled could be considerably larger.

Among those compounds which are human or animal carcinogens and which do appear in consumer products are asbestos, benzene, benzidine congener dyes, perchloroethylene, and certain compounds of cadmium and chromium. All of these are currently under study at CPSC and products containing these substances are being surveyed. Additionally, we are aware of a relatively large number of dyes, perhaps 30, excluding the benzidine congener dyes that I mentioned earlier, which have evidence of carcinogenicity and which may appear in consumer products.

Investigation of these compounds is a priority for the next fiscal year.

Finally, there are approximately 2 dozen carcinogens whose presence in consumer products is unclear. These are now moving through CPSC's chemical screening program to determine the extent of consumer exposure to them. Based upon our previous experience in chemical screening, we expect that, of these 2 dozen, only a few of these will be found in consumer products.

I do want to mention CPSC's special concern with the hazards which toxic chemicals present to artists and craftsmen, and the benefits which labeling would have for them. Our awareness of this problem has been triggered and greatly enhanced by the excellent work of Congressman Fred Richmond over the past 2 years, culminating in the introduction of H.R. 6977——

Mr. SCHEUER. If the witness will yield, I should have mentioned before that Congressman Richmond was scheduled to be here today and to sit up here with us today in questioning the witnesses. These hearings were scheduled to be at 10 a.m. and when we changed them to 1 p.m. he had commitments that he couldn't change, so he is not able to be here because of those preexisting commitments, but he will be here tomorrow, and he will testify tomorrow, and he will sit with us here.

I do want to give him full credit for having been the original sponsor of this legislation, and having taken the initiative to prepare it and bring it to our attention.

Ms. KING. He has done an excellent job of focusing on the real problem.

Mr. SCHEUER. Yes, an outstanding job.

Ms. KING. There are a number of carcinogens that we are studying and to which the bill would be applicable that are found in art materials. These include the benzidine congener and certain other dyes, asbestos, and the metals cadmium and chromium.

An artist who uses products containing these materials on a regular or semiprofessional basis could be subjected to higher exposures than the average consumer. Artists are increasingly concerned about their exposure to toxic substances and, if aware of a hazard, could take steps to reduce their exposure on the basis of full information.

Mr. SCHEUER. I might say it is more than artists. It is architects, engineers, people who work next to copying machinery and other kinds of products used in architecture and engineering shops.

Ms. KING. And as you pointed out, children.

Mr. SCHEUER. Yes, children.

Ms. KING. While we do not have at this point any estimate of the overall economic impact of H.R. 6977 on manufacturers and consumers, it is clear that the bill could lead to increased costs. The increased costs would likely be from the direct costs of ascertaining whether or not labeling is required for a substance, and either reformulating or actually going ahead with labeling of the substance, as well as possibly lost sales that may result from consumers who decide not to buy the product.

I think it is, as you say, unrealistic that any regulation is absent any cost impact. It clearly would have some impact. We are unable to say at this point how great that would be.

In addition to the automatic labeling provisions for identified carcinogens, H.R. 6977 would require labeling by individual regulation for other chronic health hazards such as those involving adverse reproductive or genetic effects, or adverse effects on the central or perhipheral nervous systems, CPSC, its sister IRLG agencies, and independent scientists are now developing information on the hazards that may be produced by compounds that cause birth defects or other reproductive disorders.

Our current understanding of these hazards is not as highly developed as our understanding of cancer hazards; however, increasing numbers of specific chemicals are being found to cause injuries that fall into one of those categories, and in certain instances, hazards to man are well demonstrated.

Finally, let me mention briefly the effects which H.R. 6977 would have on proceedings to ban hazardous household substances.

Under the present FHSA, in order to ban a hazardous household substance under section 2(Q)(1)(B) because of its chronic toxicity, the Commission must find that, notwithstanding any cautionary labeling that could be required, the degree or nature of the hazard involved in the presence or use of such substance in households is such that the objective of protecting the public health and safety can be adequately served only by banning the substance. This finding would remain unaffected by the bill.

The labeling provisions would not affect the findings the Commission would have to make in order to take further regulatory action.

Before banning a household substance, the Commission must also find that the substance is a hazardous substance as a result of its

chronic toxicity. The committee should be aware that by changing the definition of hazardous substance to include substances determined to be carcinogens by NCI, IARC, or EPA, FDA, or OSHA, the bill would also affect the scope of the issues addressed by the Commission in a proceeding to ban.

If the present bill became law, then for those substances that are deemed to be carcinogens by the organizations and agencies referred to in the bill, the Commission would no longer have to determine whether a household substance is a hazardous substance because of its carcinogenicity.

Instead, the Commission's inquiry would be limited to questions such as whether, considering the nature or degree of the risk under conditions of its anticipated use, and considering all possible labeling, banning is warranted.

So, to that limited degree, the definition will have an impact that, presumably, is broader than the intended effect of the bill.

That concludes our prepared statement, Mr. Chairman, and we would be glad to take any questions. There are various attachments to the testimony which I hope you will find useful.

Thank you.

[Testimony continues on p. 26.]

[Attachments to Ms. King's prepared statement follows:]

Suggested Technical Changes to H.R. 6977

1) Section 1 of the bill adds a new clause (F) to section 2(f)(1) of the FHSA. This clause provides that the term "hazardous substance" includes substances which the Commission determines to possess chronic toxicity because of adverse reproductive or genetic effects, adverse effects on the central or peripheral nervous system, or any other form of chronic toxicity, other than cancer or the forms mentioned above. To be consistent with the Commission's existing authority to determine that a carcinogen is a hazardous substance, the section should be amended to provide that the term "hazardous substance" includes substances which the Commission determines by regulation to possess chronic toxicity because of their carcinogenicity.

Section 2 of the bill provides that the definition of chronic toxicity includes substances determined by the Department of Health and Human Services, the International Agency for Research on Cancer, or EPA, FDA, or OSHA to be carcinogenic. In some instances, however, the Commission may make a determination of carcinogenicity before these other organizations and agencies can act. The bill should be amended to explicitly recognize this.

2) Section 4 of the bill provides that the Toxicological Advisory Board (TAB) under the FHSA must provide scientific and technical advice to the Commission concerning the new labeling provisions established by the Act. The legislative history concerning the TAB indicates that the Board should devote its energies and resources to labeling hazardous products that pose the greatest risk of short-term acute toxicity. (Congressional Record, October 14, 1978, E 5775-5776.) In light of this mandate, it may be appropriate to amend this section to provide for a different advisory committee to evaluate chronic hazard labeling or, alternatively, to alter the composition of the TAB to reflect this added responsibility.

3) Section 5 of the bill contains a provision for a delayed effective date for the provisions of the bill, including the automatic labeling provisions. To account for the situation where a new determination of carcinogenicity is made after the bill becomes effective, this section should be amended to provide that the Commission may issue regulations addressing the effective date of labeling provisions for newly determined carcinogenic substances. Such regulations would provide, for example, an exception for products already labeled or in the chain of distribution and provide manufacturers with sufficient time to change the labeling for their products after the determination of carcinogenicity is made.

Section by Section Analysis of the Bill

Summary

The bill would amend the Federal Hazardous Substances Act (FHSA) to provide that the term "hazardous substance" includes substances possessing chronic toxicity. The bill would also amend the Act to provide a definition for chronic toxicity that addresses substances that cause tumors or cancer in humans or other animals, substances which cause adverse reproductive effects or adverse genetic effects, substances which cause adverse effects on the central nervous system or any peripheral nervous system, and substances which the Commission, by regulation, determines to possess any other forms of chronic toxicity. Finally, the bill would amend section 2(p) of the Act to provide for uniform labeling statements warning that a substance has been shown to cause cancer in animals or humans.

Under the regulatory framework that would be provided by the bill, household products containing intentionally added substances for which there is strong evidence of human or animal carcinogenicity, based on valid studies and procedures and a review and determination by authoritative organizations and federal regulatory bodies, would automatically require labeling concerning the chronic hazard, if the substance is capable of being ingested, inhaled, or absorbed into the human body.

Household substances that cause other adverse chronic effects would require labeling concerning these chronic hazards if the Commission, by regulation, determined that these substances possessed chronic toxicity. Such substances would not be considered to be hazardous substances, and would not require labeling concerning chronic toxicity, unless these substances are capable of being ingested, inhaled or absorbed into the human body.

Section 1

Section 1 of the bill would amend section 2(f)(1) of the FHSA (15 U.S.C. 1261(f)(1)) to provide that the term "hazardous substance" includes substances or mixtures of substances possessing chronic toxicity because of their carcinogenicity, if the substance or mixture of substances is capable of being ingested, inhaled, or absorbed into the human body through any customary or reasonably foreseeable handling, use or misuse, including any reasonably foreseeable handling, use, or misuse by children. Such substances are not considered hazardous substances if the Commission issues a regulation, in accordance with the informal notice and comment provisions of the Administrative Procedure Act, 5 U.S.C. 553, finding that the substance does not present any risk to humans when ingested, inhaled, or absorbed into the human body.

The section also provides that the term "hazardous substance" includes substances which the Commission determines,

by regulation, to possess other forms of chronic toxicity. The other forms of chronic toxicity included in this provision are (1) adverse reproductive or genetic effects; (2) adverse effects on the central or peripheral nervous system; as well as (3) any other form of chronic toxicity. These substances are not considered to be hazardous substances unless they are capable of being ingested, inhaled, or absorbed into the human body.

This section also addresses substances possessing chronic toxicity that are present as contaminants in any household substance or mixture of household substances. These substances are considered to be hazardous substances only if the Commission, by regulation, determines that the substance is capable of being ingested, inhaled, or absorbed into the human body.

Section 2

Section 2 of the bill would amend section 2(g) of the FHSA (15 U.S.C. 1261(g)) to provide a definition for chronic toxicity. The section provides that substances possessing chronic toxicity include:

(1) Substances causing tumors or cancer (or substances that are metabolized to substances causing tumors or cancer) in humans or other mammals, including substances which the Department of Health and Human Services (including the National Cancer Institute) or the International Agency for Research on Cancer

reviews and determines to cause tumors or cancer based on valid studies and procedures. The definition also includes substances regulated by EPA, FDA, or OSHA based on a determination that the substance causes tumors or cancer.

(2) Substances causing any adverse reproductive or genetic effect, including any birth defect, toxicity to a fetus, sterility or impaired reproductive capacity, spontaneous abortion, any mutagenic effect, and any damage to genetic material. Any determination by the Commission that a substance causes any adverse reproductive or genetic effect must be based on valid studies and procedures, including the use of human subjects, experimental animals, microorganisms, culture cells, or other test systems.

(3) Substances which cause any adverse effect on the central or peripheral nervous systems. Any determination by the Commission that a substance causes such an effect must be based on valid studies and procedures. Such studies may include the use of human subjects, experimental animals, or other test systems.

(4) Substances which the Commission, by regulation, determines to possess any other form of chronic toxicity, if the substance is capable of being ingested, inhaled, or absorbed into the human body.

Section 3

Section 3 of the bill would amend section 2(p) of the FHSA (15 U.S.C. 1261(p)) to provide specific labeling for substances for which there is strong evidence of human or animal carcinogenicity. These substances must bear the phrase: WARNING: HAS BEEN SHOWN TO CAUSE CANCER IN ANIMALS," or the phrase, "WARNING: HAS BEEN SHOWN TO CAUSE CANCER IN HUMANS," where appropriate, as well as additional information concerning the identity of the manufacturer, the common or

usual name or chemical name of the hazardous substance, instructions for handling, storing, and disposing of packages, and precautionary measures that should be taken when using the substance. The labeling for substances presenting other types of chronic hazards would be specified by the Commission in the regulation determining that the substance is a hazardous substance.

In addition to the changes in the FHSA concerning the classification of substances that present chronic hazards, section 3 of the bill would change the labeling provisions of section 2(p) of the FHSA to provide that hazardous substances causing any physical side effect must bear a statement describing the nature of the side effect and procedures to be followed to counteract the side effect. Section 3 of the bill would also amend section 2(p) of the Act to provide that hazardous substances, including substances that present acute hazards, must also be labeled with language describing the proper means of disposing of these substances.

Section 4

Section 4 of the bill would amend section 20(a)(1)(A) of the FHSA (15 U.S.C. 1275(a)(1)(A)) to provide that the Toxicological Advisory Board established under the FHSA shall provide scientific and technical advice to the Commission concerning the new labeling provisions established by the Act.

Section 5

Section 5 of the bill provides that the amendments to the FHSA will take effect two years after the Act becomes law. This section specifies that the Commission has the authority to issue regulations to carry out the amendments during the two-year period after the Act becomes law. These regulations must become effective after the end of the two-year period.

Mr. SCHEUER. Very good.

Congressman Rinaldo?

Mr. RINALDO. Thank you very much, Mr. Chairman.

I certainly want to thank you for your testimony. It has been very helpful. I still have a few questions.

I recognize the dangers that are present. I certainly understand and appreciate the objectives of this legislation, but when we say that there is a present danger, why aren't we doing something under the Toxic Substances Act, which is already on the books, and which gives authority to write labeling regulations for substances and articles which contain those substances which may pose unreasonable risks to health and to the environment?

Ms. KING. The difference between the statutory authority that the Commission possesses at this time and how it would differ if the amendment was adopted is one of proceeding now on an individual basis, chemical by chemical, substance by substance. In many instances, it would require duplicative work—it is time consuming; and oftentimes we would have to make the same findings for similar chemicals over and over again. This bill would provide a generic triggering mechanism.

Mr. RINALDO. I understand that, but I am not talking about your agency. EPA already has this authority under section 6 of the Toxic Substances Control Act. Are you saying that EPA is not doing an adequate job, and if not, why not?

Ms. KING. Dr. Preuss may be able——

Mr. RINALDO. In hearings on the Toxic Substances Control Act, it was my understanding that under section 6, EPA had the authority to do this. I had assumed up to now that this was being done, and that this problem was being taken care of. Apparently, you are saying that this isn't so, and despite the authority that we gave EPA, they are not utilizing it.

Ms. KING. Dr. Preuss is in touch with EPA on these issues all the time, and probably is more able to tell you what the current status of the discussions with EPA is on that point.

Peter?

Dr. PREUSS. There are indeed efforts underway at EPA, Congressman, to look into labeling of a variety of products, a variety of substances, in fact. The difference in this particular case is, of course, that there is no automatic trigger for labeling, for giving information to consumers about substances that may be present in consumer products, as there would be under this bill.

Mr. RINALDO. When you say EPA is making efforts to look into this, do you mean that they have had the authority, they haven't utilized it, and additionally, that the authority hasn't been substantial enough?

Ms. KING. CPSC has jurisdiction over consumer products, and is specifically addressing the product or the label on the product as it reaches the consumer. I believe EPA approaches the substances per se rather than the end use products.

Mr. RINALDO. The substances, but they also under section 6 have the authority to write labeling regulations.

Ms. KING. I cannot respond to that. Andy?

Mr. KRULWICH. I wouldn't pass myself off as an expert on EPA's jurisdiction, but my understanding is that EPA does not have the

authority to require the kind of automatic labeling that this bill would provide to the Consumer Product Safety Commission.

Under this bill, if there is a finding by NCI or IARC or one of the other groups, then the automatic labeling provisions take effect. I don't believe EPA has that kind of authority.

Mr. RINALDO. I think you are clearing it up now. What you are saying, in essence, is that EPA has the authority. They haven't perhaps utilized that authority as well as we would like to see them utilize it, and they have to go through a rulemaking process as opposed to having an automatic trigger, which is in this legislation.

Am I stating it properly?

Mr. KRULWICH. The last statement, yes. The earlier statements, I am not informed on, on what they have done or haven't done.

Mr. RINALDO. I am bringing up these questions because I personally feel that one of the biggest problems we have in government regulation is duplication of authority. I want to find out whether there is any such duplication present, and if so, if it is unnecessary in the legislation that we have in front of us, and whether the bill should be amended to correct any deficiencies in it.

Let me take it a step further. As a result of the testimony that I heard and the prepared statement that I read, and what we just discussed, it would also appear that CPSC has authority to regulate chronic hazards, including requiring labels for chronic hazards. What I would like explained to me is the changes the bill would make in your ability to regulate chronic hazards.

Specifically, does this legislation, in your view, make it easier for CPSC to decide that a substance possesses chronic toxicity, and if so, what steps in your normal rulemaking authority are being eliminated?

Ms. KING. The bill provides that on a finding of carcinogenicity by three outside independent sources with regard to the first section of the bill, that the labeling would be automatically triggered by that finding, so that the difference in that respect would be the Commission not having to make a finding of carcinogenicity with regard to each and every regulation, each and every label, each and every substance that it were to approach.

It would be based on the best scientific information available to the Government at that time. That is the major difference.

Mr. RINALDO. Then don't you think we should take into consideration the fact that when the Congress created CPSC procedural safeguards were also enacted so that interested parties and affected parties would have input into the regulatory process. I recognize that those procedures are somewhat different in the Federal Hazardous Substances Act, nevertheless, we take this legislation the way it is currently written.

If we give you the authority to require labels automatically, and even require labels on the basis of findings of another body which may or may not have solicited the views of affected parties, have we done some violence to the notion that you should only regulate after soliciting the views of consumers and industry alike?

In other words, would we be bypassing that procedural step that is currently utilized when we go into an automatic trigger?

Ms. KING. Obviously, if the Commission were to regulate beyond a label, a ban or a standard, all of those procedural issues which you addressed, of course, would continue to apply and be observed.

Here, the label would state no more than the scientific finding that exists at the time as to whether or not a substance is a known human carcinogen or an animal carcinogen.

The Consumer Product Safety Commission is not a research agency. We rely in large measure on the governmental scientific agencies to draw this information in any regulatory sense.

Mr. SCHEUER. If the Congressman would yield on that question——

Mr. RINALDO. I would be pleased to.

Mr. SCHEUER. You say they would rely on a scientific finding. I take it that means your report from three outside consultants.

Ms. KING. As I understand the bill, a finding by any one of the three outside sources, the NCI, the IARC, or one of the other governmental agencies.

Mr. SCHEUER. I think Congressman Rinaldo wants to know, and I would like to know, either on an informal basis or a formal basis, would industry be invited or have the opportunity to participate in this decision as to whether the labeling as an interim measure may be justified to help people while you are going through this rather elaborate rulemaking process?

Will there be any opportunity for industry to at least make their data available?

Ms. KING. It is automatic trigger.

Mr. RINALDO. You see, that is the point. Once again, I want to stress that I favor the objectives of the legislation, but I am concerned about what happens under the bill if, for example, the Secretary of Health, and Human Services someone comes out with this finding, and there is an automatic trigger, and then someone else disputes it.

Which study has the greatest validity? Do you automatically take the first study or the second study, or doesn't it make any difference?

I am not a scientist, but in many cases when I read conflicting reports, I don't understand which report is more valid, and certainly the consumers don't understand which report is really the valid report.

With the automatic trigger, I am wondering whether or not we are correct in our presumption that the first study is automatically the correct one.

Ms. KING. I understand your question.

Mr. RINALDO. Is that the point you are driving at also?

Mr. SCHEUER. I just wonder whether industry will have a chance to explain or react or at least to give their viewpoint. For example, there may be an allegation that such and such a product has such and such a chemical, and therefore it is really a prima facie case that it is dangerous, at least the warning ought to be put out while you are running through the rule process.

There may be a very simple answer to that. The manufacturer may say, yes, they are right as far as they went, but what they don't understand is, we sprinkle sugar on it or we put it in a sauna bath for 3 minutes. They may have a perfectly valid explanation to

make a case that it really isn't dangerous to health. It may be some perfectly simple thing that the agency overlooked.

Will they have an opportunity at any point in this process, will they be asked by IARC or the National Institute of Health to submit data or to respond to some suspicions on the health effects that may be feared? Will they be involved in even this preliminary process in any way at all?

Mr. KRULWICH. There are a couple of opportunities for industry to have some input. We have suggested that the proposed legislation be amended to provide a period of time after the determination in which the manufacturer can come into the agency and via a petition process, make the kinds of arguments and state the kinds of positions that you are talking about.

The bill is patterned in a sense after the types of processes that are provided for acute toxicity. What is attempted here is to engraft into the chronic toxicity area the types of things that are done in the acute toxicity area.

In the acute toxicity area, it is a little easier. You feed an animal a substance, and a certain number of them keel over or drop dead. In the chronic toxicity area, it is a little more difficult because, depending on the substance, you may have different animals that you want to use. You may have different tests. You may have different doses.

As I understand the theory of the bill, it is that agencies, such as the NCI and the IARC, have the expertise to determine the types of tests appropriate for the particular substance that is involved, and it is that expertise that the Commission then is making use of in its determination.

Mr. RINALDO. I don't want to take up too much time. I only have one more question.

As a result of what we have discussed here, I would like to solicit your views on possibly consolidating the Consumer Product Safety Act and the Federal Hazardous Substances Act into one act, so that we wouldn't have differing procedures and different rulemaking processes for various situations. Do you think that that would still achieve the same objectives of this legislation and yet be a more efficient procedure?

Ms. KING. As the general counsel pointed out, the effort to set a baseline determination of what is chronic toxicity for purposes of automatic labeling is based on the acute labeling requirements of the Federal Hazardous Substances Act. It is to bring two sections of one law into conformance. There are no such automatic labeling provisions now under the Consumer Product Safety Act, so it is a question—it would mean picking up both provisions and moving them over to a single act, which may be a more complicated venture.

Mr. RINALDO. What we have really are different requirements in different acts. I don't think the way I threw that question out at you is 100 percent fair, but maybe what you should do is think it over and consider it, and perhaps at a later date prior to the conclusion of these hearings, you could get back to us with a statement on that.

Ms. KING. Surely, your question is, ought there be automatic labeling provisions in the Consumer Product Safety Act.

70-237 O - 81 - 3

Mr. RINALDO. Maybe we could tie both of them together so that we would not have different rulemaking procedures.

Ms. KING. Well, you are correct in saying that the provisions of the FHSA, the rulemaking procedures are different from the Consumer Product Safety Act, but that applies to the FHSA altogether, not just labels.

Mr. RINALDO. I think it would benefit everyone if that could be done. I would like you to look into that.

Ms. KING. Sure.

[Testimony resumes on p. 44.]

[The following information was received for the record:]

CONSUMER PRODUCT SAFETY COMMISSION
WASHINGTON, D.C. 20207

DEC 09 1980

The Honorable Matthew J. Rinaldo
2338 Rayburn House Office Building
Washington, D.C. 20515

Dear Representative Rinaldo:

During the hearing on HR 6977, you raised questions concerning the possibility of consolidating the provisions of the Federal Hazardous Substances Act with those of the Consumer Product Safety Act. The Commission has also been interested in this question for some time now.

In 1977, an attorney with the Office of the General Counsel prepared a discussion paper of some of the major issues that would be raised in attempting to consolidate the two acts, as well as discussions of issues that would be involved in attempting to consolidate the other acts administered by the Commission. The conclusion at the end of the paper summarizes a number of advantages and disadvantages of a consolidation that would appear to still be applicable. A copy of this paper is enclosed.

Please let me know if you have further questions.

Sincerely,

Linda B. Kiser

Linda B. Kiser
Director of Congressional Relations

Enclosure

cc: Chief Clerk, Committee on
Interstate and Foreign Commerce

UNITED STATES GOVERNMENT

Memorandum

U.S. CONSUMER PRODUCT SAFETY COMMISSION
WASHINGTON, D.C. 20207

TO: The Commission
Through: Sadye E. Dunn, Secretary
Through: David Schmeltzer, Acting General Counsel DS
FROM: Margaret A. Freeston, Assistant General Counsel and MAF
D. Stephen Lemberg, Attorney, OGC
D. Stephen Lemberg

DATE: February 18, 1977

SUBJECT: Consolidation of the Acts Administered by the Consumer Product Safety Commission into an Amended Consumer Product Safety Act

INTRODUCTION

This memorandum, at the request of the Commission, discusses some of what we believe to be major implications of consolidating into a single Consumer Product Safety Act the acts transferred to the administration of the CPSC. These "transferred acts" are the Federal Hazardous Substances Act (FHSA), the Poison Prevention Packaging Act (PPPA), the Flammable Fabrics Act (FFA) and the Refrigerator Safety Act (RSA). The basic assumption in the discussion is that the most desirable features of the transferred acts must be retained in any such consolidation. It may also be possible to revise some of the existing provisions of the CPSA to incorporate the more desirable features of the transferred acts and make them generally applicable to all of the products under the Commission's jurisdiction.

We have not attempted to present an exhaustive discussion of all of the legal, policy, and drafting problems and choices which would arise in consolidating the Commission's acts. Such an extensive document could only be undertaken in conjunction with the legal drafting itself since many problems and options would not surface until the drafting was undertaken. Therefore, since the Commission might not wish to make a firm recommendation to the Congress on the consolidation question until a draft consolidation bill can be completed and agreed upon by the Commission, the threshhold question at this time might be viewed as whether the apparent advantages of consolidation warrant making the extensive resource investment necessary to produce a draft bill.

Discussed below are some of the specific implications of an attempt to consolidate the provisions of the FHSA, FFA, PPPA, and RSA with the CPSA. Being mindful of the goal of preserving the most desirable features of the transferred acts, it seems clear that unification of the remedial portions

of the transferred acts will not present difficult drafting problems, but that accommodating the various regulatory schemes and procedures of the transferred acts, particularly the unique provisions of the FHSA, will result in a CPSA which is much longer and also much more complex than it is at present. One reason for this is that, with respect to provisions found desirable to preserve, but which cannot be applied to all of the products regulated by the Commission, consolidation may mean little more than a movement from one location in Title 15 of the United States Code to another. Moreover, it must be recognized that section 30(d) of the CPSA, as amended by the Consumer Product Safety Commission Improvements Act of 1976, presently gives the Commission a great deal of flexibility as to the regulatory approach to a risk of injury and that, in consolidating the transferred acts, some portions of this flexibility, which could be viewed as either desirable or undesirable, may be lost.

DISCUSSION

THE FEDERAL HAZARDOUS SUBSTANCES ACT

The FHSA is composed of 3 regulatory schemes, all embodied in sections 2 and 3 of the Act. The first automatically regulates thousands of products intended or packaged in a form suitable for use in the household which present one or more of certain enumerated hazards (that the product is toxic, corrosive, an irritant, a strong sensitizer, flammable, combustible, or that it generates pressure) and which may cause substantial personal injury or substantial illness during or as a proximate result of any customary or reasonably foreseeable handling or use. Once a product achieves the status of being a hazardous substance, which is generally accomplished not by rulemaking but by the fact that it meets the appropriate definition, the Act provides that it be labeled in a manner prescribed by the Act to help insure safe use and inform the user of appropriate first aid treatment. Products whose status as a hazardous substance is borderline or uncertain when the statutory definitions are applied may be declared hazardous substances by regulation. If the Commission finds that a special hazard is presented, the Commission may, by regulation, require additional or different labeling. If the Commission believes labeling is not required to protect the public health and safety, the Commission may, by regulation, exempt a product which is a hazardous substance from the statutory labeling requirements. If, because of the degree

or nature of the hazard presented, the Commission finds that any possible labeling would be inadequate to protect the public health and safety, the product may be banned by regulation.

This statutory scheme is unique among the acts administered by the Commission because it mandates the cautionary labeling of many household products without the Commission being first required to issue regulations. If the FHSA were to be simply repealed, the CPSA, as presently drafted, would be obviously inadequate to deal with the problem since, under the CPSA, hundreds, or perhaps thousands, of individual labeling regulations would need to be promulgated and each time a new product presenting a chemical or flammability type of hazard were marketed, which was not covered by an existing regulation, a new regulation would have to be considered. Should a consolidation be attempted, therefore, it would appear that the only feasible means of continuing this type of consumer protection would be to add a new title to the CPSA which essentially duplicates the regulatory scheme for labeling found in sections 2 and 3 of the FHSA.

The second regulatory scheme contained in the FHSA provides for the regulation of toys (and other articles intended for use by children). Under the FHSA, toys which are also by definition hazardous substances are banned automatically without the Commission's undertaking any regulatory action. Thus, e.g., a toy which is toxic and which can cause substantial personal injury or illness through normal or reasonably foreseeable use would be considered banned even though no banning regulation was issued. This portion of the FHSA is also unique and would probably require addition of a new title to the amended CPSA in order to be preserved.

In addition to the mechanisms for regulating the chemical and flammability types of hazards mentioned thus far, the FHSA contains a third system, for regulating the mechanical, electrical, and thermal hazards of toys (and other articles intended for use by children). These provisions, also contained in sections 2 and 3 of the FHSA, are not self-acting, because of the difficulty of specifically pre-defining such hazards in a statute. Instead, the Commission must issue individual regulations declaring certain toys

or classes of toys (or other articles intended for use by children) as being hazardous substances. Having been declared hazardous substances, these toys are then considered to be banned. This particular aspect of the FHSA is substantially similar, with the exception of the offeror process under the CPSA, to the rulemaking authority under sections 7, 8 and 9 of the CPSA. Thus, toys and other articles intended for use by children could be regulated under the CPSA in much the same manner as adult products presenting mechanical, electrical, and thermal hazards. Some adjustment in the different substantive findings required under the FHSA and CPSA would, however, have to be made.

The differences between the Commission's jurisdiction under the FHSA and CPSA also present a problem which would require reconciliation should an attempt be made to consolidate these acts. The CPSA's definition of consumer product includes products produced or distributed for sale to or for the use, consumption, or enjoyment of consumers in or around residences, schools, recreation, or otherwise. Under the FHSA, only hazardous substances that are intended or packaged in a form suitable for use in the household (and toys or other articles intended for use by children) are covered. The specific exclusions of the CPSA are similar to but broader than those in the FHSA. Under the Consumer Product Safety Commission Improvements Act of 1976, tobacco and ammunition are excluded under the FHSA as well as under the CPSA. Food, drugs, cosmetics, and pesticides are excluded under both acts. Articles such as medical devices, boat and automotive equipment, and risks of injury which can be reduced to a sufficient extent under the Occupational Safety and Health Act and the Clean Air Act, for example, are excluded under the CPSA but are not excluded under the FHSA. Thus, there are substances regulatable under the FHSA which can not be addressed under the CPSA, for which some type of accomodation would be necessary.

The rulemaking procedures differ substantially between the FHSA and the CPSA, further complicating the legal, drafting, and policy problems which must be resolved in consolidating the acts. Regulatory declarations under the FHSA that a particular product is a hazardous substance or is a banned hazardous substance are, with the exception of toys and other articles intended for use by children, under the rulemaking provisions of section 701(e) of the Federal

Food, Drug, and Cosmetic Act. Section 701(e) of that Act requires normal notice and comment rulemaking, to be followed, if legally valid objections are filed, by formal adjudicatory hearings. Mechanical, electrical, and thermal hazards of toys and other articles intended for use by children, as well as specific labeling requirements of hazardous substances, are regulated under normal notice and comment rulemaking. Under the CPSA, most substantive safety regulations are issued under section 9. This section provides for notice and comment rulemaking, except that opportunity for the oral presentation of data, views, or arguments must be provided in addition to the opportunity to present written comments. Thus, the Commission might wish to abandon the section 701(e) proceeding with respect to hazardous substances and adopt procedures similar to section 9 of the CPSA.

Another procedural difference which must be accomodated in a consolidation is that both the hazardous substance and toy provisions of the FHSA authorize the Commission to make banning actions effective upon publication in the Federal Register of a notice of imminent hazard, pending completion of the rulemaking process. Under the CPSA, only a court, upon application by the Commission, may declare a product to be an imminent hazard. As with the other problems raised, these procedural questions do not require Commission consideration or resolution now, but are only illustrative of some of the major problems that will have to be resolved.

The remedial provisions of the FHSA are contained in sections 4 through 15. Essentially, these sections enumerate the prohibited acts and allow injunctions, criminal penalties, seizures, and inspections. Civil penalties are provided for under the CPSA but not under FHSA. The criminal penalties provided for violations of the CPSA are more stringent than those under the FHSA. However, whereas CPSA criminal penalties require a showing that the person committed a violation in a knowing and willful manner after having been notified of the violation, the FHSA does not require such a showing. Moreover, the prohibited acts under the CPSA which incorporate showings that a product was distributed in commerce require only that the distribution "affected" commerce. Under the FHSA, on the other hand, the prohibited acts are tied to distribution in

interstate commerce, and not merely distributions which affect commerce. However, even though there are major differences, it would appear to be easier for the remedial provisions of the FHSA to be combined with and made to conform with those in the CPSA than it would be to combine the rulemaking provisions.

Recall authority is provided under section 15 of the FHSA. This section automatically requires banned hazardous substances to be repurchased up the chain of distribution from the consumer to the manufacturer. No recall is provided for violations that result in products becoming misbranded rather than banned. Under the CPSA, however, there is no automatic recall authority for products in violation of a banning regulation or a standard. Instead, recall,repair,or modification, at the manufacturer's option, can be ordered only after certain findings are made following an adjudicative hearing under section 15 of the CPSA.

In consolidating the recall or repurchase provisions of the FHSA with the CPSA the Commission might wish to take the opportunity to recommend changes that could be applicable to the present procedures under both acts. The Commission, in amending the FHSA regulations applicable to repurchase, recently found that automatic repurchase could be inappropriate in situations, such as the Commission's regulations on bicycles, where children's articles are declared banned on the basis of their failing to meet the requirements of a complex standard. In comparison, the Commission might find that under the CPSA it would be desirable for notice and recall to be required by regulation, and not to be dependent upon a case-by-case adjudication. One method the Commission could use to relieve both problems would be to consider recommending incorporation of a new recall authority under the CPSA applicable to all regulated products which would permit, but not require, the Commission to issue a recall regulation with each substantive regulation so that it could be applied automatically when found to be desirable. This suggestion would make recall discretionary with the issuance of each regulation. The adjudicatory type of recall under section 15 of the CPSA could be reserved for cases where there is no existing substantive regulation or where the Commission elected not to issue a recall regulation with the substantive regulation. This is merely one example of how a consolidation might be used to improve on existing provisions of both acts.

Section 18 of the FHSA contains the preemption provisions. This section has been revised under the Consumer Product Safety Commission Improvements Act of 1976 to conform closely with the preemption provisions of the CPSA. However, since requirements implementing banning regulations under the FHSA preempt state requirements, while similar requirements under CPSA banning regulations do not specifically preempt state requirements, some accommodation will be necessary.

In sum, therefore, consolidation of the FHSA with the CPSA would appear to create major problems in the areas of jurisdiction and substantive rulemaking. Resolution of these problems almost certainly would require extensive revisions to the CPSA and would result in the CPSA becoming far more complex than it is presently.

THE POISON PREVENTION PACKAGING ACT OF 1970

The PPPA authorizes the Commission to establish, by regulation, standards for the special packaging of any household substances covered by the Act as necessary to protect young children from serious personal injury or illness. In practice, this authority has been administered by setting a single performance standard (only performance standards are permitted) for special packaging. This special packaging standard is then applied to various household substances that have, by rulemaking, been added to the list of products requiring special packaging. This regulatory scheme, which contains a simple set of substantive findings, and which is implemented through normal notice and comment rulemaking, contrasts greatly with the offeror procedures of section 7 of the CPSA and the substantive and procedural requirements of section 9 of the CPSA. A comparison of the substantive findings of section 9 of the CPSA with those of section 3 of the PPPA reveals some similarities. However, since the PPPA findings are specifically applicable to the narrow type of rulemaking involved, and experience has shown them to be reasonably workable, it would seem appropriate, if a consolidation were to be attempted, to leave the required findings unchanged and incorporate them into a separate title in the amended CPSA. It would also seem appropriate to continue with the present PPPA rulemaking procedures since a new standard is not issued each time an additional substance is required to be in special

packaging and the offeror system of the CPSA would not appear suitable for the mere identification of substances for which special packaging should be required.

The jurisdictional problem is more complex under the PPPA than it is under the FHSA because food, drugs, and cosmetics are specifically included under the PPPA in addition to any article which could be classified as a hazardous substance under the FHSA. Without losing jurisdiction over food, drugs, and cosmetics because of the exclusions contained in the CPSA, it would be necessary in a consolidation to either add exceptions to the CPSA exclusions or to deal with them in a separate title to the CPSA covering poison prevention packaging.

Unlike the FHSA and the CPSA (which have self-contained enforcement provisions), the PPPA is enforced almost entirely under provisions of the FHSA and the Federal Food, Drug, and Cosmetic Act (FFDCA). As provided in section 7 of the PPPA, a food, drug, or cosmetic which is not in conformity with a required special packaging standard is considered misbranded under the FFDCA. A hazardous substance not properly contained in special packaging is misbranded under the FHSA. All of the remedies of seizure, injunction, and criminal penalties available for other misbranded articles under these acts are available for substances not in compliance with a PPPA standard. Since this dual enforcement system complicates present enforcement of the PPPA, a simple solution in consolidating the acts might be to add special provisions to the remedial sections of the CPSA and thereby eliminate reliance on the remedial provisions of the FFDCA and bring more uniformity to the handling of violations of matters under the Commission's authority.

If poison prevention packaging is retained as a separate title of the CPSA, the remaining sections of the PPPA dealing with such matters as noncomplying packaging in section 4 and rulemaking in section 5 could remain relatively intact. The technical advisory committee established in section 6 could be either retained or consolidated with the Product Safety Advisory Council under the CPSA. Preemption, contained in section 8, as amended, is basically consistent with CPSA preemption.

Therefore, while the provisions of the PPPA do not mesh with those of the CPSA, and new sections would

probably have to be added to the CPSA to permit its continued usefulness, the overall impact of such amendments would not be great, in relation to the extensive amendments which would be necessary to accomodate the FHSA.

THE FLAMMABLE FABRICS ACT

Under the Flammable Fabrics Act (FFA) the Commission can issue flammability standards for wearing apparel and interior furnishings and fabrics or related materials for use in these products. The term interior furnishing includes furnishings used in offices or other places of assembly or accommodation and therefore is more extensive than the term "consumer product," which does not include items not customarily produced or distributed for sale to or for use, consumption, or enjoyment by consumers. This discrepancy will have to be addressed in any consolidation legislation.

The regulatory scheme under the FFA is that the Commission may issue flammability standards under notice and comment rulemaking, but must also provide the opportunity for an oral presentation of views, as is required for the issuance of consumer product safety rules under the CPSA. The findings the Commission must make include the need for the standard and that it is reasonable, technologically practicable and appropriate, stated in objective terms, and limited to items that present the identified risks of injury. These findings are not substantially different from the requirements for issuing safety rules under the CPSA. However, before issuing a flammability standard, the Commission must find an unreasonable risk of the occurrence of fire leading to death, injury or significant property damage. Since the CPSA does not address property damage, some adjustment would have to be made in consolidation.

Under the FFA there are currently in effect two flammability standards that were made effective by Congress by passage of the Act in 1953, and which were continued in effect when the FFA was amended in 1967. In any consolidation, these standards will have to be explicitly continued in effect.

The FFA is enforced under the Federal Trade Commission Act, and a violation of the FFA or rules and regulations issued under the Act are considered unfair methods of competition and unfair and deceptive acts or practices in commerce, under the Federal Trade Commission Act. Thus, a violation must be enforced through the cease and desist order procedure provided under the FTC Act, involving a consent agreement leading to an order or an adjudicative proceeding before an

administrative law judge to obtain an order. Civil penalties are available for violations of orders. In addition, the FFA provides for seizure and injunction and for criminal penalties for willful violations of the Act. Because the Act is enforced under the Federal Trade Commission Act, the Commission believes it has the authority to pursue criminal penalties, seizure and injunctions on its own, as does the FTC. This procedure is substantially different from that available under the CPSA, which requires acting through the Department of Justice, with certain conditions. Therefore, while an integration of the FFA enforcement procedures in an amended CPSA is desirable and possible, several difficult questions need to be resolved in so doing.

The preemption provision of the FFA has been amended to be substantially similar to that of the CPSA, and the National Advisory Committee for the FFA, established by section 17, could be either retained or consolidated with the Product Safety Advisory Council under the CPSA.

Section 14 of the FFA requires an annual report to Congress. This could be incorporated into the requirements of section 27 of the CPSA regarding annual reports.

The FFA guaranty provisions under section 8 are similar in concept to those under the certification provisions of section 14 of the CPSA but would have to be addressed in any consolidation.

Essentially, the FFA has a regulatory scheme for the development of safety standards for products and it contains an assortment of administrative and enforcement provisions. In this respect it is very similar to the CPSA except that the FFA deals with a more narrow range of products and risks. This can be contrasted with the regulatory scheme of the FHSA which defines risks in generic terms and automatically requires certain labeling of products meeting the definitions. Therefore, a consolidation would not necessarily require establishment of a special title to maintain the existing regulatory scheme. Instead, it would seem possible to integrate the provisions of the FFA with those of the CPSA. Such an integration could have the effect of eliminating enforcement of the FFA under the

FTC system, which is more geared in language toward the competitive and economic aspects of the distribution of consumer products in the marketplace. Nevertheless, such an integration would be difficult, primarily because of the past history and body of legal precedents, especially in the area of enforcement, which would have to be accommodated. In this respect the problems of consolidation would be similar to those regarding consolidation of the enforcement provisions of the FHSA and PPPA which have a long history of legal precedent under food and drug law.

THE REFRIGERATOR SAFETY ACT

The Refrigerator Safety Act makes it unlawful for a household refrigerator to be introduced into interstate commerce in violation of a standard prescribing the use of a device to enable the door to be opened easily from the inside. This Act, and the standard implementing it, could be integrated without difficulty into the CPSA.

RECODIFICATION OF REGULATIONS

An important consideration to be recognized, should a consolidation be accomplished, would be the necessity to again revise and recodify existing regulations under the transferred acts. The original revision and recodification of these regulations, which took place after the Commission acquired the transferred acts, required a considerable drafting effort. The revision and recodification of regulations which would be required after a consolidation would require a much greater expenditure of resources and could, if major changes are made to the substance of the underlying legislation, be a more complex task than drafting the consolidation legislation itself. This problem could be compounded if the major changes in existing law required substantive revisions of regulations that would be subject to public procedure and judicial review.

CONCLUSION

The major advantages of consolidation would be the opportunity to provide greater uniformity among the Commission's procedures and the possibility of improving

upon existing statutory provisions contained in the CPSA as well as in the transferred acts. The disadvantages appear to be the reduction in present flexibility to be able to use the statutory provisions of various acts to approach a problem, the increased complexity of the CPSA that is certain to result from an accommodation of several quite different statutory schemes, and the uncertainty which will result from changing statutory provisions having a well developed history of judicial interpretation under the law of food and drugs, unfair methods of competition, and unfair and deceptive acts or practices in commerce. As we perceive it, the question before the Commission at this time is whether the advantages seen in consolidation outweigh the disadvantages to an extent sufficient to warrant the necessary expenditure of resources. Even if the staffs of the relevant congressional committees do the initial drafting, instead of the Commission's staff, a great deal of time would have to be spent in assisting the congressional drafting effort. Perhaps the Commission might wish to present the relevant congressional committees with its ideas of consolidation in an attempt to determine the likelihood of success seen for such an undertaking before making a firm recommendation.

The Office of the General Counsel would be happy to provide any additional discussion or information regarding the implications of consolidating the acts and will await further Commission guidance as to the next step the Commission wishes to take.

Mr. RINALDO. Thank you very much.

I don't have any further questions, Mr. Chairman.

Mr. SCHEUER. Later this afternoon, Chairman King, we are going to have witnesses testifying that the labels that are currently affixed to art supplies are not sufficiently detailed. Are you confident that the enactment of this bill will insure adequate labeling with respect to product hazards?

Ms. KING. Well, the required labeling as it is spelled out in the bill notes a hazard. It would specifically say that the product contains a substance which is a human or animal carcinogen. It may be that people would prefer more explicit information than that.

You also indicated that oftentimes a possible need to indicate to the user precautionary measures that might be undertaken, and in that sense some latitude on the part of the Commission's ability to determine what is most useful might in fact be helpful, because oftentimes these things do not mean a great deal to the user without a little more information.

Mr. SCHEUER. Yes. I find that many, if not most of the labels that come on foods, that tell what is in a food product, are not very helpful. They use all kinds of scientific jargon, a list of chemicals. Most people don't know what the devil those chemicals are or what they mean and their implications, and also frequently in both food and drug advertising the print is so small that old codgers like myself have a difficult time in reading them even when I have my bifocals on.

I would urge you in labeling to do something about language, make the language simple laymen's terms, and not just put a list of chemicals, but indicate in some simple degree what the actual danger is in layman-like language, and to make these labels of a design and a typeset that they can be easily read.

Ms. KING. Those are clearly very important considerations. Our experience with labeling is that people are becoming not only more sophisticated about labeling, but are beginning to use and incorporate information that is available.

Our own experience with regard to our telephone hotline and our mail inquiries each year is that they are doubling and quadrupling each year, and the questions that are being asked specifically go to what is in my product, is it dangerous to me?

In the hair dryer instance, with which you are very familiar, the question that was asked is, can you tell me if my hair dryer does in fact contain asbestos? And if so, what do you recommend I do, or what is the manufacturer suggesting as a possible remedy? They were specifically seeking that kind of information.

Mr. SCHEUER. Very good. That is encouraging.

Let me ask one more question having to do with the ban. Would you think that before your agency has the right to ban something, that the Commission ought to be required to consider perhaps two things: No. 1, the social utility of the product, whether the product really fills a role, and No. 2, whether there is any other substitute for the product that is not toxic?

Ms. KING. We consider those issues as a matter of course in all rulemaking. In addition to that, the economic implications of a regulation or a ban.

Mr. SCHEUER. Just systematically, that is considered in your rulemaking process?

Ms. KING. Yes.

Mr. SCHEUER. Very good.

OK. Thank you very much for your testimony.

Thank you very much, all of you.

Ms. KING. Thank you, sir.

Mr. SCHEUER. We now have a panel of Dr. Michael McMann and Ms. Gail Barazani. We are very happy to have you both here. If you have prepared statements, they will be printed in full in the record.

Mr. SCHEUER. So, you can go ahead as you please. I would suggest just chatting with us informally, and hitting the high spots of your testimony, and averting to anything we have heard before from the colloquy we have had with Commissioner King or anything that she said. Let's keep this very informal, and take it as you will.

Who is going to be first?

All right, Doctor. Please proceed as you wish.

STATEMENTS OF MICHAEL McCANN, PH. D., NEW YORK, N.Y.; AND GAIL BARAZANI, CHICAGO, ILL.

Dr. MCCANN. Mr. Chairman and members of the subcommittee, my name is Michael McCann, and I have a Ph. D. in chemistry from Columbia University, and am a certified industrial hygienist.

For the last 6 years, I have been doing extensive writing, lecturing, and consulting in the health hazards of art and craft materials. I am the author of a book on this subject, of a pamphlet, of numerous articles, and have given over 75 lectures on art hazards to artists' organizations, art schools, art teachers, and organizations of health professionals. I am also president of the Center for Occupational Hazards, a nonprofit organization which is a clearinghouse for research and information on the health hazards of art and craft materials.

I became involved in the health hazards of arts and crafts materials as a result of a visit to a silk screen printing workshop in 1974. After about 20 minutes, I had a headache and my eyes were burning from the large amount of solvent vapors in the room. There was no ventilation.

But what was even more horrifying was that 8- and 10-year-old children were being exposed to the toxic chemicals.

When I asked the teachers whether they experienced health problems from the solvents, they said that symptoms like headaches, nausea, skin problems, et cetera, were common and accepted as part of being an artist. No one had ever told them that these chemicals were highly toxic, and that more serious long-term illnesses could also result, or that children, who are more susceptible to toxic chemicals, should not be exposed to these chemicals. And, of course, they were never taught how to work safely with these chemicals.

This experience had a great effect on me, and I wanted to do something about it. I started writing and lecturing on this topic. At the same time, I interested Watson-Guptill Publications in a book on this subject, which was published last year. Its title is "Artist

70-237 O - 81 - 4

Beware: The Hazards and Precautions in Working with Art and Craft Materials."

I have three basic points to make today in my testimony.

First, large numbers of people are becoming ill as a result of overexposure to hazardous art materials.

Mr. SCHEUER. How ill? Is it just a passing thing?

Dr. MCCANN. I will give examples in a minute.

Second, these illnesses are occurring because artists do not know art materials may be hazardous or how to work with them safely.

Third, the way to prevent unnecessary illnesses is to require adequate labeling.

First, in terms of the illness, one of our main activities at the Center for Occupational Hazards is operating the Art Hazards Information Center, which answers written and telephone inquiries from all over the country. At present, we are receiving an average of 30 such inquiries every day from artists, craftspeople, art teachers, art schools, hobbyists, parents, physicians, and even poison control centers.

A good percentage of these inquiries are from people who have experienced illnesses which they think are related to their art materials. In many of these cases, this has been verified by their physicians.

Mr. SCHEUER. What kind of illnesses?

Dr. MCCANN. Examples of illnesses that we are finding are the same chronic diseases that you find in industry, chronic lead poisoning, silicosis—permanent lung scarring—chemical pneumonia, mercury poisoning, toxic neuropathy, mesothelioma, asthma, kidney damage, aplastic anemia, nasal sinus cancer, heart attacks, miscarriages, and, of course, skin problems.

In some instances, it might be difficult to prove a direct causal relationship, but in some it isn't. For example, mesothelioma is a type of cancer that is essentially only caused by exposure to asbestos. We know of a case of mesothelioma in a potter whose only exposure to asbestos was in possibly asbestos contaminated talcs.

Mr. SCHEUER. Asbestos contaminated what?

Dr. MCCANN. Talcs, talcum powders. They are used in ceramics a lot for casting. So, there is an example of where it is directly shown to be related to the art material. The reason that artists are developing the same occupational illnesses as industrial workers is that their art materials contain many of the same hazardous chemicals that are used in industry, only they are often using them in their home. Examples of hazardous chemicals commonly found in art and craft materials are: lead, cadmium, uranium, mercury, formaldehyde, benzene, toluene, hexane, silica, asbestos, and many, many more.

How widespread is this problem? Unfortunately, we don't know because there haven't really been good surveys on artists. But there have been some questionnaires that have been distributed. They seem to indicate that 25 to 65 percent of artists have experienced health problems related to their art materials.

Studies of occupational mortality in Washington State and in England and Wales found that artists and art teachers died at a higher rate from leukemia, among other diseases.

Mr. SCHEUER. And that would come from the ingestion of what?

Dr. McCann. That would come from inhalation of benzene. That is the major concern there. Up until about 2 years ago, when the Consumer Product Safety Commission moved to ban benzene, it was present particularly in paint strippers, also in rubber cement in years past. That is probably where we expect leukemia would come from.

The question is, Who is at risk? We are not just talking about professional artists and crafts people. We have also seen illnesses in art teachers and students, hobbyists, and even children. The people using the art materials are not the only ones at risk.

For instance, we have one documented case of a couple in New Hampshire doing stained glass in their kitchen. They didn't have any problem, but their 4-year-old son developed lead poisoning. The New York City Poison Control Center has said there have been three fatalities in a couple of years just from the habit of putting turpentine and mineral spirits in a glass, a coke bottle, an orange juice container, and a child drinking it.

So, that is a question there.

How many people are at risk? It is really a difficult to find out the number of people that are involved. It has been estimated, though, that there are several hundred thousand professional artists and craftspeople in the United States. In addition, a 1975 Harris poll found that 39 percent of the population over 16—representing 56.7 million people—are engaged in crafts, and that 16 percent—representing 21.8 million people—are engaged in painting, drawing, or sculpture. And, of course, every child is exposed to materials, either at school or in the home.

From the foregoing, it is clear that tens of millions of people are at risk from exposure to hazardous art materials, and that people are actually developing illnesses that are due to overexposure to these hazardous materials.

My second point is that these illnesses are occurring because artists do not know that these art materials may be hazardous or how to work with them safely.

In my numerous visits to artists' studios, art schools, et cetera, and from my discussions with artists, it is clear that artists do not know the hazards of their art materials or how to work safely. For example, they don't know proper ventilation, the proper type of personal protective equipment, safe handling procedures, and the like. For example, we are constantly finding people are using the wrong type of respirators, or they use cheap dust masks from a hardware store which really don't protect anyone against toxic materials. The dust masks will state: "For nontoxic dust." But unless you know something is toxic or nontoxic, you wouldn't know what mask to use. Some of the responsibility for this lack of knowledge rests with art schools and art teachers. These professionals should be teaching their students the hazards of the art materials and how to work with them safely. However, a greater part of the responsibility lies with the manufacturers of the art and craft materials. After all, teachers can't relay information about art material hazards if manufacturers withhold this information from them, if teachers don't know materials are hazardous.

In my opinion, art material manufacturers are not living up to their legal and moral obligations to sell adequately labeled art

materials. In many cases the warning labels are not inadequate—they are nonexistent. For example, I have seen red lead, asbestos, silica, uranium oxide, and cadmium sold without any warning label, although all of these are highly toxic and most may cause cancer.

However, the problem does not stop here. Those warning labels which are used by some art materials manufacturers are inadequate for a number of reasons. First, under the present Federal Hazardous Substances Act, only acute hazards have to be listed and described.

Second, many of the warnings are too vague. For example, the same term "vapor harmful" can usually be found on materials like acetone, which is only slightly toxic, and hexane, which is highly toxic. So, there is no way for an artist to differentiate between their degree of hazard.

Third, the precautionary statements are often meaningless. The commonest statement is "Use with adequate ventilation." However, this means an open door or window to the vast majority of artists. An open door or window is not usually even minimal ventilation if you are dealing with all but the smallest amounts of materials.

Fourth, the addresses on the label may be wrong. Many of the inquiries we get from Poison Control Centers come to us because the Poison Control Center has not been able to find the company that manufactured a particular art product. In many cases there is no answer at the telephone number listed or the company has moved from the address listed on the container.

In addition to inadequate labeling, manufacturers of art materials often will not provide artists and craftspeople with more detailed information on the contents and hazards of their art materials.

Yet another problem is that many of the art materials used by artists and craftspeople are industrial chemicals, and the artists get these materials from industrial suppliers. This is particularly true in printmaking, plastics, dyeing, and ceramics.

Hobbyists get small amounts from special distributors to the hobby industry, but professional artists and craftspeople obtain their supplies in larger amounts from industrial suppliers. On several occasions, when I have tried to get information on these materials from the suppliers and manufacturers, they have said that they only sell to industries who already know the hazards of the material and and how to work safely with the materials.

It is only after I tell them that I can show them bills of sale from art schools and individual artists that they acknowledge that they do sell to this market. However, they still say that the size of the market is too small for them to pay special attention to it in terms of information.

In summary, artists and craftspeople do not know the hazards of their materials or how to work safely with them because manufacturers and distributors are not providing adequate labeling of the art materials, nor are the manufacturers receptive to providing information on the hazards and precautions when requested to do so.

My third point is that the way to prevent these unnecessary illnesses is to require adequate labeling of art materials. There are

two ways to obtain better labeling of art materials: Through voluntary compliance on the part of the industry, or through mandatory legislation.

Unfortunately, the first approach has failed. The industry has not done much. There are very few materials that are adequately labeled, and speaking with industry spokesmen, they claim that they are following all the regulations of the Federal Hazardous Substances Act for acute hazards.

Industry has said they will put chronic hazard labeling on their products when they are required to do so by Government legislation, and not before.

I believe the only solution is for Congress to pass legislation that would require art material manufacturers and distributors to put adequate labeling on their products, which would include: One, listing the chemical names of all toxic ingredients—including both acute and chronic hazards; two, listing the actual physical effects of overexposure, for example, in terms of hexane, "May cause permanent nerve damage;" three, listing precautions; and four, listing medical treatment where necessary.

I think that Representative Fred Richmond's bill, H.R. 6977, which would amend the Federal Hazardous Substances Act to include chronic hazard labeling, addresses itself directly to these problems, and I enthusiastically endorse this bill.

This bill, if enacted, could have another beneficial effect. It would probably encourage the development of safer art materials. At present, there is no way to compare different art materials in order to be able to choose the safest materials. If there was proper labeling, then artists and others could avoid the most dangerous materials and choose safer alternatives, which would also, I believe, lead industry to develop safer products.

For example, it is doubtful that an art manufacturer would have much success with an art material that was labeled "Danger, contains asbestos. Has been shown to cause cancer in humans." In the long run, this could force art manufacturers to develop safer products.

In conclusion, I think that Congressman Richmond's bill, H.R. 6977, is a major step toward eliminating the unnecessary illnesses among artists, craftspeople, art teachers, hobbyists, and children that has been caused by inadequate labeling. People using art materials will know the hazards and how to work with their art material safely.

Thank you.

[Testimony resumes on p. 61.]

[Dr. McCann's prepared statement follows:]

STATEMENT OF MICHAEL McCANN, PH. D., NEW YORK, N.Y.

My name is Michael McCann, and I have a Ph.D. in chemistry from Columbia University and am a certified industrial hygienist. For the last 6 years, I have been doing extensive writing, lecturing and consulting in the health hazards of art and carft materials. I am the author of a book on this subject, Artist Beware: The Hazards and Precautions in Working with Art and Craft Materials, of a pamphlet, Health Hazards Manual for Artists, of numerous articles, and have given over 75 lectures on art hazards to artists organizations, art schools, art teachers, and organizations of health professionals. I am also president of the Center for Occupational Hazards, a non-profit organization which is a clearing-house for research and information on the health hazards of art and craft materials.

I became involved in the health hazards of art and crafts material as a result of a visit to a silk screen printing workshop in 1974. After about 20 minutes I had a headache and my eyes were burning from the large amount of solvent vapors in the room. There was no ventilation. But what was even more horrifying was that 8 and 10-year old children were being exposed to the toxic chemicals. When I asked the teachers whether they experienced health problems from the solvents, they said that symptoms like headaches, nausea, skin problems, etc. were common and accepted as part of being an artist. No one had ever told them that these chemicals were highly toxic, and that more serious long-term illnesses could also result, or that children, who are more susceptible to toxic chemicals, should not be exposed to these chemicals. And, of course, they were never taught how to work safely with these chemicals. This experience had a great effect on me and I wanted to do something about this problem. When I later met the editor

of an artists' newspaper, Art Workers News, I suggested doing some articles on the hazards of art materials. I did so. These articles were later compiled into the Health Hazards Manual for Artists. At the same time I interested Watson-Guptill Publications in a book on this subject, which was published last year. Its title is Artist Beware: The Hazards and Precautions in Working with Art and Craft Materials.

I have three basic points to make today in my testimony:

First, large numbers of people are becoming ill as a result of overexposure to hazardous art materials.

Second, these illnesses are occurring because artists do not know art materials may be hazardous or how to work with them safely.

Third, the way to prevent unnecessary illnesses is to require adequate labeling of art materials.

FIRST, PEOPLE ARE BECOMING ILL FROM OVEREXPOSURE TO ART AND CRAFT MATERIALS

One of the Center for Occupational Hazards' main activities is the Art Hazards Information Center, which answers written and telephone inquiries from all over the country. At present, we are receiving an average of 30 such inquiries every day from artists, craftspeople, art teachers, art schools, hobbyists, parents, physicians and Poison Control Centers. A good percentage of these inquriies are from people who have experienced illnesses which they think are related to their art materials. In many of these cases, this has been verified by their physicians.

As a result we are finding that artists and craftspeople are becoming ill with the same occupational diseases that are found

among industrial workers. This includes not only acute illnesses resulting form a single overexposure, but also chronic diseases resulting form months, years and sometimes even decades of exposure. Examples of occupational diseases being found among artists and craftspeople are:

--lead poisoning among painters, potters, stained glass craftspeople
--silicosis among potters, jewelers, stone sculptors, foundryworkers
--chemical pneumonia in jewelers, welders
--mercury poisoning among painters, metalworkers
--toxic neuropathy in silk screen printmakers, collage artists
--mesothelioma (cancer of lining of chest cavity) in a ceramicist
--liver damage in plastics sculptors, printmakers, commercial artists
--asthma in potters, plastics sculptors, batik artists
--kidney damage in painters, photographers
--aplastic anemia (destruction of bone marrow) in a lithographer
--nasal sinus cancer in woodworkers
--heart attacks in furniture refinishers
--miscarriages in silk screen printmakers
--dermatitis among almost every type of artist and craftsperson.

The reason that artists are developing the same occupational illnesses as industrial workers is that their art materials contain many of the same hazardous chemicals that are used in industry--only they are often using them in their home. Examples of hazardous chemicals commonly found in art and craft materials are: lead, cadmium, uranimum, mercury, formaldehyde, benzene, toluene, hexane, silica, asbestos, nitric acid, caustic soda, potassium dichromate, and many more. Almost all art and craft media involve the use of hazardous chemicals, as shown in the accompanying table.

Hazards of arts and crafts

CERAMICS	asbestos, silica, glaze components (lead, barium, lithium), colorants (copper manganese, nickel, chromates, cadmium, antimony, uranium), kiln gases (sulfur dioxide, carbon monoxide, fluorine, chlorine, nitrogen oxides), heat.
COMMERCIAL ART	hexane, dyes, aerosol spray fixatives, aromatic hydrocarbons, bleaches, pigments (cadmium, manganese, chromates, etc.), air brushing paints and dyes.
DYEING	benzidine-type dyes, fiber-reactive dyes, azoic dyes, acids (sulfuric, oxalic, acetic), alkalies (sodium carbonate, ammonia), dichromates, copper sulfate, sodium hydrosulfite, wax fumes.
FIBER ARTS	anthrax, cotton, flax dust, molds, physical strain.
JEWELRY	bone and shell dust, cadmium fumes, fluoride fluxes, silica, asbestos, hydrogen cyanide, mercury.
METAL SCULPTURE	metal fumes (lead, zinc, copper, chromium, nickel, etc.), silica, asbestos, heat, infrared radiation, nitric and sulfuric acids, nitrogen oxides, noise.
PAINTING	pigments (lead, cadmium, manganese, chromium, antimony, etc.), mercury preservatives, turpentine, mineral spirits, ethyl alcohol, lacquer thinners.
PHOTOGRAPHY	alkalies, acetic acid, hydroquinone, ino phenol sulfate, formaldehyde, sulfur dioxide, dichromates, mercuric chloride, sodium cyanide, iodine, selenium, uranium nitrate, sodium sulfide.
PRINTMAKING	pigments (lead, chromates, manganese, cadmium, etc.), solvents (turpentine, mineral spirits, xylene, lacquer thinners, benzene, ethyl alcohol, chlorinated hydrocarbons, etc.), acids (nitric, sulfuric, phosphoric, hydrochloric), nitrogen dioxide, chlorine, phenol, dichromates, ultraviolet radiation.
PLASTICS SCULPTURE	styrene, methyl methacrylate, diisocyanates, formaldehyde, organic peroxides, aliphatic amines, solvents (acetone, methylene chloride, ethylene dichloride, lacquer thinner, etc.), carbon monoxide, hydrogen chloride, hydrogen cyanide, asbestos, silica, fiberglass.
STAINED GLASS	lead, zinc chloride flux, copper sulfate, selenium dioxide, antimony sulfide, hydrofluoric acid, silver nitrate.
STONE SCULPTURE	silica, asbestos, noise, vibration.
WELDING/BRAZING	metal fumes (cadmium, lead, zinc, copper, nickel, chromium, mercury, manganese, beryllium), fluoride fluxes, ozone, nitrogen dioxide, ultraviolet radiation, heat, chlorinated hydrocarbons, phosgene.
WOODWORKING and furniture refinishing	solvents (benzene, methyl alcohol, methylene chloride, toluene, turpentine, mineral spirits), wood dust, noise, vibration, formaldehyde, epoxy resins.

How widespread is this problem? Unfortuately we don't really know since there have been few studies on artists and craftspeople. One such study of the Crafts Professionals of Vermont by Drs. Julian Waller and Larry Whitehead provides some information. They found that 25% of the craftspeople reported health problems in the last 12 months related to their craft materials.

A questionnaire distributed by the Professional Artists Guild of Long Island included questions on whether the artists had experienced art-related health problems. Of 102 responses, 65% indicated that they thought they have had health problems caused by their art materials.

NIOSH (The National Institute for Occupational Safety and Health) interviewed 42 people duirng a Health Hazard Evaluation at Cooper Union School of Art. Of the 42, 17 people (40%) indicated that they had experienced health problems due to their art materials.

Some idea of the risk to artists can be obtained from occupational mortality studies. A study of occupational mortality in Washington State found elevated risks to artists and art teachers for cancer of the lymphatic and blood-forming systems, and for cirrhosis of the liver. The 1951-1961 Registrar-General's Decennial Supplement for England and Wales found an increase in leukemia for painters and engravers. And a recent report on Occupational mortality in California for 1959-1961 found increased risk for male artists and art teachers due to cancer of the large bowel. Dr. Aaron Blair of the National Cancer Institute is presently conducting a study of death certificates from deceased artists to determine if artists are dying of certain diseases at a higher rate than the general population.

Who is at risk? Inquiries we receive at the Art Hazards Information Center clearly demonstrate that professional artists and craftspeople are not the only people at risk. Illnesses due to art materials are also occurring among art teachers and students, hobbyists and children. Examples include silicosis in a pottery teacher who has only been working in the area for 10 years; an almost fatal case of chemical-induced asthma in a high school art teacher; aplastic anemia--involving destruction of 80% of the bone marrow--in a well-known lithography teacher, Tad Lapinski; chlorine poisoning in several students and teachers working with Dutch Mordant; hyperactivity in children doing silk screen printing; and lead poisoning in a stained glass hobbyist, to name a few.

In some instances the people using the art materials are not the only ones at risk. For example, a New Hampshire couple who did stained glass in their kitchen had no problems. However, their 4-year old son developed lead poisoning.

How many people are at risk? Accurate figures on the number of artists and craftspeople are difficult to obtain. However it has been estimated that there are 250,000 to 350,000 craftspeople in the U.S., at least 129,000 painters and sculptors, and 70,000-80,000 art specialists in the schools. In addition, a 1975 Harris poll found that 39% of the population over 16--representing 56.7 million people--are engaged in woodworking, weaving, pottery or other crafts; and that 16%--representing 21.8 million poeple--are engaged in painting, drawing or sculpture. And of course, every child uses art materials, either at school, in community art centers, or in the home.

From the foregoing, it is clear that tens of millions of people are at risk from exposure to hazardous art materials; and further, large numbers of professional artists and craftspeople, art teachers, hobbyists, and children are actually developing illnesses that are due to overexposure to hazardous art and craft materials.

SECOND, THESE ILLNESSES ARE OCCURRING BECAUSE ARTISTS DO NOT KNOW ART MATERIALS MAY BE HAZARDOUS OR HOW TO WORK WITH THEM SAFELY.

In my numerous visits to artists' studios and art schools, and from my discussions with artists, it is clear that artists do not know the hazards of their art materials or how to work safely. For example, they don't know proper ventilation, the proper type of personal protective equipment, safe handling procedures, and the like.

Some of the responsibility for this lack of knowledge rests with art schools and art teachers. These professionals should be teaching their students the hazards of the art materials and how to work with them safely. However, a greater part of the responsibility for this lack of knowledge and resulting illnesses rests with the manufacturers of the art and craft materials. After all, teachers can't relay information about art material hazards if manufacturers withhold this information from them.

In my opinion, art material manufacturers are not living up to their legal and moral obligations to sell adequately labelled art materials. In many cases the warning labels are not inadequate--they are nonexistent. For example, I have seen red lead, asbestos, silica, uranium oxide, cadmium silver solders, and benzidine dyes sold without any warning label, although all of these are highly toxic and most may cause cancer.

However the problem does not stop here. Those warning labels which are used by some art materials manufacturers are inadequate for a number of reasons. First, under the present Federal Hazardous Substances Act, only acute hazards have to be listed and described. In fact, according to one conversation I had with Chuck Jacobsen of the Consumer Product Safety Commission, a company legally could place a non-toxic label on asbestos powder since it passes all the acute toxicity tests listed in the Federal Hazardous Substances Act. And, as discussed previously, many of the illnesses artists are suffering from are chronic illnesses resulting from long-term exposure to hazardous art materials.

Second, many of the warnings are too vague. For example the same term "vapor harmful" can usually be found on materials like acetone which is only slightly toxic, and hexane, which is highly toxic. The warning should include a more detailed rating system to indicate the degree of hazard and also a more specific warning as to the actual type of illness that can be caused. For example, containers containing hexane should have a warning like "Can cause permanent nerve damage from repeated exposure."

Third, the precautionary statements are often meaningless. The commonest statement is "Use with adequate ventilation." However this means an open door or window to the vast majority of artists. In actuality adequate ventilation usually means use of an exhaust fan or local exhaust system such as a laboratory hood or spray booth. In addition if goggles, gloves, or respirators are necessary this should be included in the precautions.

Fourth, the addresses on the label may be wrong. Many of the inquiries we get from Poison Control Centers come to us because

the Poison Control Center has not been able to find the company that manufactured a particular art product. In many cases there is no answer at the telephone number listed or the company has moved from the address listed on the container. This is particularly a problem with small companies that repackage chemicals for distribution to the art market. In cases of acute poisoning, this inability to reach the manufacturer could have serious consequences.

In addition to inadequate labeling, manufacturers of art materials often will not provide artists and craftspeople with more detailed information on the contents and hazards of their art materials. Requests for Material Safety Data Sheets commonly go unanswered, or if forth-coming are not accurate. For example, the contents section is often incomplete and the health effects section is usually inadequate. In one instance, the health effects section for a product containing 50% benzene stated only: "Irritation to mucous membranes--headaches--dizziness." However benzene is well known as a cause of destruction of the bone marrow (aplastic anemia) and leukemia.

I myself have had difficulty in obtaining this type of information, and I know of instances in which physicians have been unable to get information on the contents of art materials, even when they tell the company that they have a patient who is ill as a result of exposure to the art material.

Yet another problem is that many of the art materials used by artists and craftspeople are industrial chemicals, and the artists get these materials from industrial suppliers. This is particularly true in printmaking, plastics, dyeing, and ceramics. Often hobbyists

get small amounts from special distributors to the hobby industry, but professional artists and craftspeople obtain their supplies in larger amounts from industrial suppliers. On several occasions, when I have tried to get information on these materials from the suppliers and manufacturers, they have said that they only sell to industries who already know the hazards of the material and how to work safely with the materials. It is only after I tell them that I can show them bills of sale from art schools and individual artists that they acknowledge that they do sell to this market. However, they still say that the size of the market is too small for them to pay special attention to it in terms of information.

In summary, artists and craftspeople do not know the hazard of their materials or how to work safely with them because manufacturers and distributors of the art materials are not providing adequate labeling of the art materials, nor are the manufacturers receptive to providing information on the hazards and precautions when requested to do so.

THIRD, THE WAY TO PREVENT THESE UNNECESSARY ILLNESSES IS TO REQUIRE ADEQUATE LABELING OF ART MATERIALS.

There are two ways to obtain better labeling of art materials: through voluntary compliance on the part of the industry, or through mandatory legislation.

Unfortunately, the first approach has failed. Representative Richmond and others have tried for several years to make industry recognize the problem and do something about it. To date nothing has

been done beyond the industry holding a conference on the problem in 1979 which, so far as I can tell, has resulted in no further activity. Further, industry spokesmen have said that they are following all the regulations of the Federal Hazardous Substances Act, and that they will put chronic hazard labeling on their products when they are required to do so by government regulation and not before.

I believe that the only solution is for Congress to pass legislation that would require art material manufacturers and distributors to put adequate labeling on their products, which would include: (1) listing the chemical names of all toxic ingredients--including both acute and chronic hazards; (2) listing the actual physical effects of overexposure; (3) listing precautions; and (4) listing medical treatment where necessary. I think that Representative Fred Richmond's bill, H.R. 6977, which would amend the Federal Hazardous Substances Act to include chronic hazard labeling, addresses itself directly to these problems and I enthusiastically endorse this bill.

Besides providing artists, craftspeople, hobbyists and teachers with information on the hazards and precautions to use with art materials, this bill, if enacted, could have another beneficial effect. It would probably encourage the development of safer art materials. At present, there is no way to compare different art materials in order to be able to choose the safest materials. If there was proper labeling, then artists and other could avoid the most dangerous materials and choose safer alternatives. For example it is doubtful that an art manufacturer would have much success with an art material that was labeled "Danger. Contains asbestos. Has been shown to cause cancer in humans." In the long run this could force art manufacturers to develop safer products.

In conclusion, I think that Representative Richmond's bill, HR 6977, is a major step towards eliminating the unnecessary illnesses among artists, craftspeople, art teachers, hobbyists and children that has been caused by inadequate labeling of art and craft materials. With adequate labeling, people using art materials will know the hazards and how to work with their art materials safely.

Mr. SCHEUER. Well, thank you very much for a very interesting and definitive statement.

Do you wish to testify now?

STATEMENT OF GAIL C. BARAZANI

Ms. BARAZANI. Good afternoon, Mr. Chairman and members of the subcommittee.

I would like first to express my gratitude to Congressman Richmond and his staff and to the members of this subcommittee for the chance to participate in this hearing on H.R. 6977.

As what I think of as an ordinary citizen, I believe my participation reflects and affirms the democratic process in which my faith, though it has occasionally wavered in recent years, still prevails.

Mr. SCHEUER. Excuse me. Your testimony will be printed in full in the record.

Ms. BARAZANI. Somewhat to establish my credentials, although I am not a chemist——

Mr. SCHEUER. Your credentials are unquestionably accepted. OK?

Ms. BARAZANI. There is a somewhat lengthy section which describes my background as an artist and an art teacher. I think that, as I said, establishes some of my credentials.

As I say in the testimony, in the written testimony, my husband and I have had a studio in our house for 32 years of our marriage, and we have lived very closely with art materials and art processes. I myself have worked in the arts and my husband has been an art professor during all of this period.

I came to question the health effects of working with art materials from a long, intimate association with them. Our children grew up in the same house, and sometimes in the same room with art processes, and probably took their presence for granted as a natural part of their environment, and seldom, if ever, misused them.

However, I would not, knowing what I know now, repeat this experience of raising children in the studio.

I never questioned the safety of firing a ceramics kiln four and five times a week in my basement, preparing for shows and art fairs. There were no indications anywhere on my ceramic supplies that gases, dusts, and fumes of clay and glaze components could be anything but annoyances. But these components were silica bearing clays, asbestos-contaminated talcs, sulfur compounds, fluorides, and oxides of lead, chromium, arsenic, cadmium, manganese, lithium, and vanadium, to mention only a few materials from which the worker in the industrial workplace must be protected by law.

I believe these materials can be handled safely, but people have to know what the hazards are and how to avoid exposure. We can mount a major public education program through Federal and State agencies, but you and I know how long it would take for the public to receive the information. The only feasible method of informing consumers, whether they be artists, teachers, hobby workers, or small production studio workers, is assuring that every product sold to be used in arts, crafts, and related fields, should be accurately identified with a complete list of contents, and should be accompanied by sufficient warnings of potential health effects.

I will skip the section on background of my interest and activities which led to my writing a book for the College Art Association

70-237 O - 81 - 5

called "Safe Practices in The Arts and Crafts: A Studio Guide," and also, my working with Dr. Bertram Carnow of the School of Public Health of the University of Illinois in Chicago Medical Center. He is currently head of the Great Lakes NIOSH Training Center, and I have been working closely with him, employed at the School of Public Health during some of the past 5 years.

My references for safe practices in the arts and crafts were standard occupational medicine and industrial hygiene texts. I was able to consult daily with professionals in occupational health, hygienists, and toxicologists.

Because of my writing, I have received thousands of inquiries and hundreds of accounts of adverse health effects of working in the arts. Some of those I have included in the back of my testimony. I have many more with me, but I didn't have time to Xerox them or copy them.

Since my work at the university involved organizing an information center, I saw and used current literature that was applicable in this field. During the past 5 years, I have worked with the Chicago Lung Association because of their interests in inhalation standards. I am helping them organize an information center, which is the result of continuing public concern about potential health hazards in working in the arts.

A look through any artist's supply store or catalog today will reveal thousands of products for hundreds of processes. To indicate to those who are not familiar with the range of art processes, I have enclosed the table of contents of my book as appendix A. [See p. 71.] This list represents only a fraction of subject area and processes that might be included, such as lasers, computers, electronics, forging, and even earthmoving machinery.

For many of these areas, industrial raw materials and tools are used, but for many art processes, raw materials are repackaged, as is the case with the metal oxides used in ceramics and glassblowing, and distributed as art supplies. This repackaging of materials must be done with controls to assure that the safety information that may or may not be on the 500-pound bag must be supplied for the 2-ounce package.

Let me illustrate the need for these controls. I had hoped that testimony here could be given by Harvey Mueller, a potter from Belleville, Ill. Harvey was one of the people who wrote me in 1974 asking about barium carbonate. I had written that barium carbonate was a poisonous material, that it was used as rat poison in industry. In my articles, I had described the symptoms of barium poisoning as narrowing of blood vessels and muscle pain and spasms; symptoms that Harvey was having, but for which he had been unable to find either the cause or relief.

Harvey was indignant that the barium carbonate he bought in 100-pound bags and stored rather loosely in his school and home studios and that he tracked around as dust through the school and into his home was never labeled as poisonous. He was so shocked and indignant that he began to investigate his clays, glazes, and materials used by other art teachers in his community.

He bought industrial hygiene monitoring equipment and measured the contaminants in the air around his firing kiln. He spent thousands of dollars on laboratory tests of his blood and hair, and

on the materials he used. The tests showed that every one of the clays he used was contaminated with arsenic as were some of his commercial glazes.

Mr. SCHEUER. Did he die of these causes?

Ms. BARAZANI. He died of leukemia, and the causes are not clear.

Mr. SCHEUER. Let me say that I have to go now for this rollcall vote, but if you would like to continue testifying to amplify the record for another couple of minutes, there is no reason why you can't.

Ms. BARAZANI. I would like to finish part of it. I think some of it would be useful.

Mr. SCHEUER. We will take another 3 or 4 minutes, and then we will suspend the hearing for about 10 minutes.

Ms. BARAZANI. OK.

Commercial glazes that he used gallons of weekly were as much as 45 percent lead. His urine tests showed high levels of arsenic, copper, and other metals.

Harvey died this past August of a rare form of leukemia. Whether or not his death was caused by the materials he used in his life as an artist and art teacher may never be decided. But there is no doubt that he was unknowingly exposed to highly toxic substances sold as, or contaminating, art materials. He should have been able to determine whether he could work safely with the ingredients in the clays and glazes he bought. He should have had fair warning.

Harvey's story is one of many that are emerging and some we will hear about in today's testimony. Because of space limitations, I have included only a few copies of letters I have received from artists describing health problems encountered while working with art materials.

Arguments against the need for including descriptive warning literature on the package have cited small quantities of the hazardous substance that would result in very slight contamination of the user's work area or self. These arguments sometimes use the TLV or threshold limit value, permissible exposure limit determined by Federal regulations. Threshold limit values are determined under workplace conditions using healthy workers as models. They are far from applicable to the unpredictable conditions and varied population that is likely to be exposed to paints, solvents, aerosol products, adhesives, et cetera.

As an illustration, let me describe one example of product use that has not been anticipated by manufacturers. A young woman wrote to me that she was working at home designing hooked rug backings. She worked at home because she was pregnant and had a 2-year-old to look after.

In her work, she used daily several dozen permanent ink-type markers, and she was feeling dizzy and getting sore throats from inhaling the vapors from the markers. The solvents used in such markers are highly volatile so that they are fast drying, and a frequently used solvent is naphtha.

The permissible exposure limit for naphtha is 100 parts per million, or 400 mg/m^3, for a healthy worker. Perhaps the quantity the young woman was inhaling would be within permissible limits, technically, although I doubt that, but how could the safe level of

naphtha be determined for her fetus, or for the 2-year-old in the same room?

Artists' supplies can and should be accurately labeled with a list of contents, appropriate warnings of toxicity, and protective measures necessary to prevent or reduce exposure. While this might seem an appalling task to manufacturers, an example that it can be accomplished is attached to my testimony, Weldwood Contact Cement.

This label contains a list of the product's hazardous ingredients and extensive instructions and warnings, including, "Keep visitors out" and "Unplug refrigerator, furnace, and other appliances." This product was brought to me by an artist who is a modelmaker and frequently works at home. He said he could not possibly work with this cement in his house, as good as it is.

While it could be argued that Roberts Consolidated Industries of California, who manufacture Weldwood Contact Cement, may have lost a sale here, a sick or injured customer, or one whose house has burned down, is not likely to do much purchasing in the future.

Discussing this label, I failed to mention that it has a diamond-shaped hazard label, which is recognizable to us from highway safety programs, and I consider that as an example of the fact that we can develop simple symbols that are indicative of the hazard in a product.

Assessment of potential toxicity or hazards in art supplies or their ingredients will not be an easy task, although for most substances utilized in them, there is existing information in regard to likely exposure in the industrial workplace. The use to which products are put, and in the arts that use can be unlimited, will determine the extent of toxicity or hazard. This is why the participation of the art community in assessment and labeling discussions is essential.

The production and distribution of materials identified as art supplies is a multimillion-dollar business. "Hobby" equipment and materials sell well, even in a struggling economy. Basement or garage workshops for photography, stained glass working, resin casting, furniture refinishing, miniature making, ceramics, and even glassblowing, exist everywhere, and not only in basements, but sometimes in high-rise buildings.

Neighborhood and institution craft and painting workshops, schools at all levels, including universities with foundries, welding shops, and printmaking areas, art and vocational schools with electronic, microwave, and laser equipment, small production shops that produce ceramics, wood products, glass, leather, and plastic objects, all represent a large population that is exposed daily on a full-time basis to the same materials from which the industrial worker must be protected by law.

Since there is no legislation which protects the art worker who works in a school or in most of the above situations, and certainly none that protects the man or woman or child working at home, or the other occupants of that home, certainly the logical beginning of protection must be in appropriate labeling, accurate labeling, and instructive labeling of all products sold for use as art materials or supplies.

[Testimony resumes on p. 78.]

[Ms. Barazani's prepared statement and attachments follow:]

STATEMENT OF GAIL C. BARAZANI, CHICAGO, ILLINOIS

I would like to express my gratitude to Congressman Richmond and his staff and to the members of this Subcommittee for the chance to participate in this hearing on H.R. 6977. As what I think of as an ordinary citizen I believe my participation reflects and affirms the democratic process in which my faith, though it has occasionally wavered in recent years, still prevails.

I have been a working artist and craftsman for more than thirty-five years. I have taught art and the crafts to people from three to ninety years, and I have worked as an art therapist with pregnant teenagers. My mother encouraged me to make things from the time I was three and I attended art school from the age of ten through my adolescence. I have worked in metals, wood, plastics, and mosaic materials, and until recently I worked regularly in my home, making and firing small sculptural ceramic pieces in my basement.

My husband, Morris Barazani, a painter and professor of art, has used oil and acrylic paints, drawing and collage materials of all kinds, and a multitude of solvents, adhesives, and pigments. His studio has been in or connected to our house for most of our thirty two year marriage. A major part of our income has gone over these years to the manufacturers and distributors of art materials. I say this to indicate that my testimony here is not intended to inhibit the production of potentially hazardous materials, or to obstruct the access to such materials by artists. My testimony is intended to provide an argument for accurate and informative labeling of art materials that are potentially hazardous.

So I come to the question of the health effects of working with art materials from a long, intimate association with them. Our three children grew up in the same house and sometimes in the same rooms with art processes and we were proud that they took their presence for granted as a natural part of their environment and seldom, if ever, misused them. I would not, knowing what I have learned in recent years, repeat this experience of raising children in the studio, however.

For although we were careful about tools and electricity, we did not know that solvents, paints, lacquers, adhesives, or ceramic materials could be harmful. Modest warning labels on a few materials, saying "Use in a well-ventilated room" or "Keep Out of the Hands of Children", did not seem explicit enough, and were far from indicating the serious harm that could result from inhaling their vapors, fumes, or gases and dusts.

I never questioned the safety of firing a ceramics kiln four and five times a week in my basement, preparing for shows and art fairs. There were no indications anywhere on my ceramic supplies that gases, dusts, and fumes of clay and glaze components could be any thing but annoyances. But these components were silica bearing clays, asbestos contaminated talcs, sulfur compounds, fluorides, and oxides of lead, chromuim, arsenic, cadmuim, manganese, lithium, and vanadium, to mention a few, materials from which the worker in the industrial work-

place must be protected by law.

These materials that we unwittingly made part of our home environment contaminated the air breathed by our and the neighbors' children and our asthmatic father. They are today present in the household, studio, and school environments of millions of Americans providing the potential for chronic, low level exposure, and the possibility of aggravating unspecific symptoms at least and disabling disease or death at worst.

I believe these materials can be handled safely but people have to know what the hazards are and how to avoid exposure. We can mount a major public education program through federal and state agencies, but you and I know how long it would take for the public to receive the information. The only feasible method of informing consumers, whether they be artist, teachers, hobby workers, or small production studios, is assuring that every product sold to be used in arts, crafts, and related fields, should be accurately identified with a complete list of contents, and should be accompanied by sufficient warnings of potential health effects.

While I have used art materials and taught art, I have also spent the last six years researching and writing in occupational health and safety. In 1973, I became alarmed after reading an article in the New York Times Magazine[1] about the work of Irving Selikoff, M.D. of Mt. Sinai Hospital in New York City, whose research in the hazards of asbestos exposure indicates that no level of exposure can be considered safe.

As an artist and teacher, I had frequently used powdered asbestos that I purchased in five pound bags at the hardware store. I had also used commercial paper mache mixes that contained asbestos, and my friends in the theater used it in making scenery. My alarm at making this discovery stimulated my interest in other materials and eventually led to my meeting and working with Bertram W. Carnow, M.D., of the School of Public Health at the University of Illinois, Medical Center, Chicago and Director of the Great Lakes Training Center for Occupational Medicine.

Dr. Carnow expressed an interest in the problems of artists and agreed to speak at a meeting at the Field Museum in Chicago in April 1974. A transcript[2] of that talk was circulated for a number of years by an informal group called Hazards in the Arts. The demand for information increased and I found myself working to organize educational programs and conferences, writing articles and columns[3]. In 1976, I was employed in the Occupational and Environmental Medicine area of the School of Public Health, first as a Research Assistant and then as Associate. Because of my activities in this area, I was asked by the College Art Association of America to write a handbook on health and safety. In 1979, they published my book, "Safe Practices in the Arts and Crafts: A Studio Guide".[4]

My references for "Safe Practices..." were standard occupational medicine and industrial hygiene texts. I was able to consult with professionals in occupational health, hygienists, and toxicologists almost daily. Because of my writing, I had received thousands of inquiries and hundreds

of accounts of adverse health effects of working in the arts. Since my work at the University involved organizing an information center, I saw and used current literature that was applicable to this field.

During the past five years, I have worked with the Chicago Lung Association as a speaker and in the development of educational programs and conferences for artists and craftsmen and the concerned public. This organization, because of its concern for inhalation hazards, has published and circulated a pamphlet about art hazards since 1976. It has mailed more than 6,000 "Hazards in the Arts" newsletters, a publication funded in part by a grant to me from the National Endowment for the Arts. Initial funding for an Occupational Health and Safety Information Center, for which I am the Director, has been received by the Lung Association from the Illinois Arts Council.

A look through any artists' supply store or catalog today will reveal thousands of products for hundreds of processes. To indicate to those who are not familiar with the range of art processes, I have enclosed the table of contents of my book as Appendix A. This list represents only a fraction of subject areas and processes that might be included such as lasers, computers, electronics, forging, and even earth moving machinery. For many of these areas, industrial raw materials and tools are used but for many art processes, raw materials are repackaged, as is the case with the metal oxides used in ceramics and glassblowing, and distributed as art supplies. This repackaging of materials must be done with controls to assure that the safety information that may or may not be on the five hundred pound bag, must be supplied for the two ounce package.

Let me illustrate the need for these controls. I had hoped that testimony here could be given by Harvey Mueller, a potter from Belleville, Illinois. Harvey was one of the people who wrote me in 1974 asking about barium carbonate. I had written that barium carbonate was a poisonous material, that it was used as a rat poison in industry. In my article[5], I had described the symptoms of barium poisoning as narrowing of blood vessels and muscle pain and spasms; symptoms that Harvey was having but for which he had been unable to find either the cause or relief.

Harvey was indignant that the barium carbonate he bought in one hundred pound bags and stored rather loosely in his school and home studios, and that he tracked around as dust through the school and into his home, was never labeled as poisonous. He as so shocked and indignant that he began to investigate his clays, glazes, and materials used by other art teachers in his community. He bought industrial hygiene monitoring equipment and measured the contaminants in the air around his firing kiln. He spent thousands of dollars on laboratory tests of his blood and hair, and on the materials he used. The tests showed that every one of the clays he used was contaminated with arsenic as were some of his commercial glazes. Commercial glazes that he used gallons of weekly were as much as 45% lead. His urine tests showed high levels of arsenic, copper, and other metals.

Harvey died this past August of a rare form of leukemia. Whether or not his death was caused by the materials he used in his life as an artist and art teacher may never be decided. But there is no doubt that he was

unknowingly exposed to highly toxic substances sold as, or contaminating, art materials. He should have been able to determine whether he could work safely with the ingredients in the clays and glazes he bought. He should have had fair warning.

Harvey's story is one of many that are emerging and some we will hear about in today's testimony. Because of space limitations, I have included only a few copies of letters I have received from artists describing health problems encountered while working with art materials, but I have many such letters as do my colleagues.

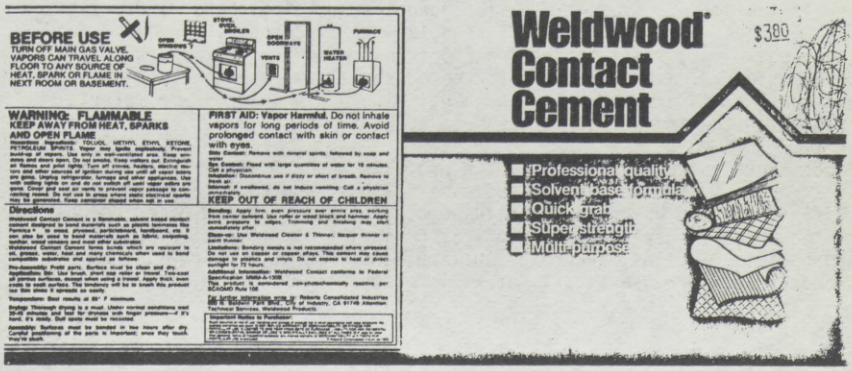
Our concern here today is with amending the Federal Hazardous Substances Act to establish labeling requirements applicable to substances which cause chronic health side effects. Evidence in the literature[6] of occupational and environmental medicine has shown that exposure to toluene, xylene, petroleum derivatives commonly found in solvents and solvent based materials, orthodichlorobenzene, found in leather dyes, ethylene dichloride, used as a cement for acrylic plastics, all are capable of serious health effects. Virtually no product sold for use in the arts or crafts is without some such substance in its contents.

Arguments against the need for including descriptive warning literature on the package have cited small quantities of the hazardous substance that would result in very slight contamination of the user's work area or self. These arguments sometime use the TLV or Threshold Limit Value, permissible exposure limit determined by federal regulations. Threshold Limit Values are determined under workplace conditions using healthy workers as models. They are far from applicable to the unpredictable conditions and varied population that is likely to be exposed to paints, solvents, aerosol products, adhesives, etc.

As an illustration, let me describe one example of product use that has not been anticipated by manufacturers. A young woman wrote to me that she was working at home designing hooked rug backings. She worked at home because she was pregnant and had a two year old to look after. In her work, she used daily several dozen permanent ink type markers and she was feeling dizzy and getting sore throats from inhaling the vapors from the markers. The solvents used in such markers are highly volatile so that they are fast drying, and a frequently used solvent is naphtha. The permissible exposure limit for naphtha is 100 parts per million, or 400mg/m^3,[7] for a healthy worker. Perhaps the quantity the young woman was inhaling would be within permissible levels, technically, although I doubt that, but how could the safe level of naphtha be determined for her fetus, or for the two year old in the same room?

Artists' supplies can and should be accurately labeled with a list of contents, appropriate warnings of toxicity, and protective measures necessary to prevent or reduce exposure. While this might seem an appalling task to manufacturers, an example that it can be accomplished is "Weldwood Contact Cement". This label contains a list of the product's hazardous ingredients and extensive instructions and warnings including "Keep visitors out", and "Unplug refrigerator, furnace, and other appliances". This product was brought to me by an artist who is a model-maker and frequently works at home. He said he could not possibly work with this cement in his house, as good as it is.

While it could be argued that Roberts Consolidated Industries of California, who manufacture Weldwood Contact Cement, may have lost a sale here, a sick or injured customer, or one whose house has burned down, is not likely to do much purchasing in the future.



The Weldwood label contains the familiar diamond-shaped "Flammable" warning sign that is immediately recognizable on railroad cars and trucks. In an environment increasingly filled with toxic and hazardous substances, most of us have grown observant of the signs and symbols that warn of corrosives, explosives, and radiation hazards. We are learning a new visual language that is essential in an age of highly complex technology, in which average citizens must deal with thousands of chemical compounds, many of which have only been present in the human environment in this century.

A set of symbols which will readily identify the potential hazards in products sold as art supplies should be devised. Ideally such symbols could be common to all consumer products, but for the present, representatives from the arts, educators, manufacturers and distributors of art supplies, toxicologists, and professionals in occupational medicine and industrial hygiene, should be brought together with the task of devising easily recognizable symbols that will warn and instruct the consumer of art supplies.

Assessment of potential toxicity or hazards in art supplies or their ingredients will not be an easy task, although for most substances utilized in them, there is existing information in regard to likely exposure in the industrial workplace. The use to which products are put, and in the arts that use can be unlimited, will determine the extent of toxicity or hazard. This is why the participation of the art community in assessment and labeling discussions is essential.

The production and distribution of materials identified as art supplies is a multimillion dollar business. "Hobby" equipment and materials sell well, even in a struggling economy. Basement or garage workshops for photography, stained glass working, resin casting, furniture refinishing, miniature making, ceramics, and even glass-blowing, exist everywhere, and not only in basements, sometimes in high-rise buildings. Neighborhood and institution craft and painting workshops, schools at all levels including universities with foundries, welding shops, and printmaking areas, art and vocational schools with electronic, microwave, and laser equipment, small production shops that produce ceramics, wood products, glass, leather, and plastic objects, all represent a large population that is exposed daily on a full-time basis to the same materials from which the industrial worker must be protected by law.

Since there is no legislation which protects the art worker who works in a school or in most of the above situations, and certainly none that protects the man or woman or child working at home (or the other occupants of that home), certainly the logical beginning of protection must be in appropriate labeling, accurate labeling, and instructive labeling of all products sold for use as art materials or supplies.

References

1. Sherrill, Robert. Asbestos, the Saver of Lives, has a Deadly Side. The New York Times Magazine, January 21, 1973, New York.

2. Carnow, Bertram W., M.D. Health Hazards in the Arts and Crafts. Transcript of a talk given at the Field Museum in Chicago, Illinois, April 1974.

3. Barazani, Gail. Beware of Hazards in the Arts, Parts I and II, The Working Craftsman, Summer, Fall issues, 1974, M. Heise, Publisher, Northbrook, Illinois.

4. Barazani, Gail. Safe Practices in the Arts and Crafts: a Studio Guide. Publisher, The College Art Association of America, New York City, 1979.

5. Barazani, Gail. Protecting Your Health, Summer 1975.

6. NIOSH/OSHA Pocket Guide to Chemical Hazards, U.S.D.H.E.W. and U.S.D.O.L., September, 1978. (listed here as containing general summary of current literature)

7. Ibid. page 136

Appendices

A. Table of Contents. Safe Practices in the Arts and Crafts: A Studio Guide.

B. Reference list for above.

C. Partial list of materials used in the arts and crafts that are capable of causing chronic disease.

D. Suggested symbols for labeling certain art products.

Note - Appendix D
Suggested Symbols omitted

Sample letters from artists included

Contents

Preventing Dermatitis If You Work With Epoxy Resins. US Department of Health, Education, and Welfare, NIOSH, Washington, DC. Pub. Nos. 74-130.

Ramazzini, Bernardo. 1964. *Diseases of Workers* Trans. W. C. Wright. NY: Hafner.

Registry of Toxic Effects of Chemical Substances. 1976 ed. US Department of Health, Education, and Welfare. Public Health Service, Center for Disease Control, NIOSH, Rockville, MD 20852. For sale by the Superintendent of Documents, US Government Printing Office, Washington, DC 20402.

Respiratory Protective Devices Manual. 1963. American Conference of Governmental Industrial Hygienists, Committee on Respirators, 1014 Broadway, Cincinnati, OH 45202.

Rhodes, Daniel. 1957. *Clay and Glazes for the Potter*. Philadelphia: Chilton.

Sax, N. I. 1968. *Dangerous Properties of Industrial Materials*, 3d ed. New York: Van Nostrand Reinhold.

Siedlecki, Jerome T. 1968. Potential Health Hazards of Materials Used by Artists and Sculptors. *Journal of the American Medical Association* (June 24). Reprints from Department of Occupational Health, American Medical Association, 535 N. Dearborn St., Chicago, IL 60610.

Siedlecki, Jerome T. 1972. Potential Hazards of Plastics Used in Sculpture. *Art Education* (February).

Stellman, J. M., and S. M. Daum. 1973. *Work Is Dangerous to Your Health: A Handbook of Health Hazards in the Work Place and What You Can Do about Them*. New York: Vintage.

Stemmer, Klaus L., *et al*. 1975. Pulmonary Exposure to Polyurethane Dust, *Environmental Health Perspectives*, Vol. XI (June), US Government Printing Office, Washington, DC 20402.

Thomas, Charles C., T. T. Mercer, and P. E. Morrow. 1972. *Inhalation Studies with Freshly Generated Polyurethane Foam Dust*. Springfield, IL. p. 540.

Threshold Limit Values. 1976. American Conference of Governmental Industrial Hygienists, 1014 Broadway, Cincinnati, OH 45202.

Untracht, Oppi. 1975. *Metal Techniques for Craftsmen*. Garden City, NY: Doubleday.

US Environmental Protection Agency. 1976. *Investigation of Selected Potential Environmental Contaminants: Ketonic Solvents*. National Technical Information Service, Springfield, VA 22151. Document No. PB 252 970.

Voss, W.A.G. 1970. *Advances in the Use of Microwave Power*. US Department of Health, Education, and Welfare, Washington, DC.

Waldbott, George, M.D. 1973. *Health Effects of Environmental Pollutants*. St. Louis: the C. V. Mosby Company.

The Welding Environment: A Research Report on Fumes and Gases Generated during Welding Operations. 1973. American Welding Society, 2501 7th St. NW, Miami, FL 33125.

Welding Safely. 1972. US Department of Health, Education, and Welfare, NIOSH. Public Health Service Pamphlet No. HSM 72-10261.

Williams, William A. 1975. *Accident Prevention Manual for Shop Teachers*. American Technical Society, 5608 Stony Island Ave., Chicago, IL 60637.

PARTIAL LIST OF MATERIALS USED IN THE ARTS AND CRAFTS

THAT ARE CAPABLE OF CAUSING CHRONIC DISEASE

(as listed in OSHA and NIOSH publications)

CARCINOGENS

Arsenic compounds
Asbestos
Benzene
Benzidine based dyes
Cadmium oxide
Chromium
2-Naphthylamine (dyes)
Nickel compounds

OTHER CHRONIC DISEASES

Antimony
Arsenic
Barium Carbonate
Bentonite
Cadmium
Fluorospar
Metal salts, chlorides
Copper
Cryolite
Flint
Lead compounds
Lithium
Manganese
Selenium
Uranium oxide
Vanadium pentoxide
Aniline
Benzene and derivatives
Xylene, Toluene, Cumene, etc.
Carbon tetrachloride
Chromic Acid
Cobalt
o-, and p- Dichlorobenzene
Ethylene dichloride
Formaldehyde
Hexane
Hydroquinone
Methylene chloride
Nitric acid
Phenol
Phthalic anhydride
Selenium
Silica
Soapstone
Styrene
Sulfur compounds
Sulfuric acid
Trichloroethylene
Turpentine
Methyl cellosolve acetate
Isophorone (ketone)
Methyl alcohol
Potassium dichromate

SP W/K column
XL 4/22/75

1307 Jefferson Av..
New Orleans, La. 70115
August 28, 1975

Hazards in the Arts
Box 3
Hubbard Woods, Ill. 60093

Gentlemen:

I've just read about your efforts in "House Beautiful" — a long overdue attack on a many-sided problem.

One bit of testimony: — Several years ago I took a course of instruction in découpage. I noticed two of the regular workers in the studio holding their noses frequently, the way people sometimes do on planes or in elevators & was told they were trying to "clear their ears." One confided that her hearing had recently begun to fade.

Near the end of six weeks I was struck with "inner ear" disturbances which took several months of medical treatment to cure. My doctor saw no relevance to the plight of the studio workers. I was always convinced, however, that the acrylic spray in an aerosol can was the culprit for them as well as for me, and one later told me that her hearing improved slightly after she left the studio, but that some of the loss was permanent.

[dizziness, loss of balance, some pain in one ear, ringing in the ear, or a dull hollow sensation]

Congratulations on your good work, in alerting the public. Very truly yours, S.D. / Harry

June 12, 1980

[redacted]

Dear People:

I'm writing to you in hopes that I may gain a better understanding of what's been happening to me for the past five months and also to see is there may be some useful information to be shared with other artists working with similar materials.

I'm a painter. I've been working for about four years with ppray paints -- oil based enamels, auto body metallic paints, metal primers, Rustoleums, Testor hobby paints, spray dope, some lacquers -- anything that sprayed and gave me the color range I needed. I work in two ways: I paint on the reverse side of plexiglas sections, which are then laminated into a mosaic/painting onto masonite with carpenter's latex contact cement. I havealso used some white glues, and spray adhesives. I cut and sand the edges of the plexiglas myself. (slide enclosed)

I also work with the same paint supplies on paper, often scrubbing down the paper with turpentine to remove excess paint. I began wearing a respirator (for fumes) several months ago and rarely change the paper filter and never change the charcoal filter. I worked in a small spray room with an open window and a small fan. I've since learned that this was quite inadequate.. At times after working for 8-10 hours spraying, I felt headachy and a bit nauseated. I also began tasting paint for several days afterward, and finding paint traces in the mucus of my nose.

For 3½ years, I've had a few minor problems: some occasional skin irritations, rashes, swollen eyes. Allergists could not determine the source of irritation. Lately, I've been working with greater concentration. In February, shortly after painting solidlyfor about a week, I got some flu-like symptoms: aching joints, head-aches, high fever, chills and sweating. I was also aware of some photosensitivity. Following 24 hours of high fever, there followed 5-7 days of low-grade fever, and joint aches increased. I also had difficulty focusing my eyes (could not read), had some minimal problems with balance and co-ordination, especially fine motor co-ordination (could not draw or write, button clothing, or cut food), and had swollen glands. Within the week I broke out with a terrific rash, beginning on the chest and face and gradually spreading over my body. The rash coagulated after about 3-4 days and felt like a horrible burn, followed by peeling skin. I had gone many time to a doctor's group and was told that it was a strange virus or perhaps rubella. Tests were all negative and blood count was okay.

On. Wednesday, January 28th, while painting in my studio, I poured a polymer solvent into a coffee can in order to clean my brushes. It was a solvent produced by [redacted] and the label says it contains XLOL which my doctor says tells you nothing. I painted several hours with the coffeecan about 15 ft. from my work table. Occasionally, I would free the paint with my thumb and forefinger, thereby, getting the solvent on my hands. Not having water in the studio and having to carry it in bottles I would merely wipe my hands on my paint rag instead of washing them. The label says to work the wet brush in a cup or the palm of your hand which led me to believe there was no problem. Unfortunately, I neglected to read the last part of the label which said to avoid prolonged and repeated breathing of vapor or contact with skin or eyes. This label is pretty ambiguous.

At dinnertime I began to feel nauseous and went up to lie down. I had spots in front of my eyes and my heart beat so rapidly I could feel it in my ears. After about ten minutes the feeling subsided so I decided to return to the studio to get the brushes and finish the cleaning job. The odor of the fumes was overpowering as I cleaned the brushes in the kitchen sink. When I finished I had a dish of vanilla ice-cream as I felt empty not having eaten since noon. This was about eight o'clock. Within five minutes after eating the ice-cream I was engulfed with nausea and proceeded to explode with both vomiting and diarrhea. The vomiting became more frequent until I was retching at five minute intervals. My bowels activated about eight to ten times within an hour or a little better. My husband became concerned as my color turned grey and I told him I felt as though the life was draining out of me. Our doctor was out of town so he took me over the emergency room at Oconomowoc Memorial Hospital. My vital signs werenot registering as it was impossible to get a temperature reading. However, I was concious but told the nurse I felt as though I might faint.

Dr. [redacted] from [redacted], Wis. was called and gave instructions to put me on intravenous feeding and to take my blood-pressure and temperature every fifteen minutes all night. The retching continued fro sometime despite the shot that was administered. The blood tests and urinalysis indicated no kidney or liver damage. When the doctor dismissed me he said that they were assuming it was the solvent but it could have been gastrintis. I told him I knew it was the solvent as I could taste it when I got sick. I knew it was the solvent before the vomiting actually started. I asked if there was anything special I need do on returning home and he said nothing special.

I returned home Friday noon -Janurary 30th and the following Monday afternoon I decided to start painting. I set-up in my book-room and painted all afternoon. I did this Tues. and Wed. and by Wed. evening I wasnot feeling well. Somewhat uneasy in my stomach and very shaky and persoired with the least effort. I was aware of the odor of the paints ([redacted] Polymer) all of the time that I was painting but thought I was being psychosomatic. On Thurs. morning I felt drained and shaky inside and out and a friend insisted that I should call Gail Barazani in order to find out if I could possibly become toxic again from the use of the paints. At her suggestion I have stopped painting and my April show has been post-pomed until September.

At this writing almost two weeks have gone by and I am still feeling drained and weak. Exertion of the smallest kind causes me to perspire and I am fatigued all of the time. I have been staying down most of the morning and trying to stay up the rest of the day and retiring early evening. Really could just stay in bed all of the time but I feel that would be a mistake and very hard on my muscles so I am making passing efforts at moving around during the afternoon. My concentration and co-ordination leave something to be desired.

[redacted]
Delafield, Wis.

Mr. SCHEUER. Thank you very much.

[Brief recess].

Mr. SCHEUER. The subcommittee will resume.

Dr. McCann, on page 12 of your statement, you mention that H.R. 6977 is necessary to force art manufacturers to develop safer products. This assumes that there are safe chemicals to be substituted for chemicals which now cause adverse health effects.

Dr. MCCANN. Well, safer products to me means that you can find products which are less hazardous. I mean, the degree of hazard gets to be an important factor.

Mr. SCHEUER. For some products, like asbestos, there is no safe level of exposure. What is the answer to a product that contains asbestos, as I said, for which there is no safe level of exposure?

Intellectually, looking at it, it would seem to me that a label is not the answer, because unless you can instruct people as to how to use a product containing asbestos so that there is no exposure, there is no point in warning people if there is nothing they can do about it.

My information is, if a product contains asbestos, there is no safe level of exposure, and in that case labeling might even be counterproductive, in that once you have labeled it, it would take the heat off the banning process, the process of banning through rulemaking procedure?

Might not that be the only appropriate remedy? I am in support of this bill categorically. I don't want anybody to misunderstand that.

Dr. MCCANN. I agree personally. In a case like asbestos, I believe the remedy is to ban it. Labeling in the interim can, I think, have an enormous effect. When we have told artists that such-and-such material can contain a dangerous chemical, then all of a sudden they wake up to it, and in many cases they say, I am not going to use that. I am not going to have my children around that.

I think that would bring more pressure to bear in terms of the process of banning it.

Mr. SCHEUER. It might also provide an incentive to the manufacturer to find a substitute for asbestos.

Dr. MCCANN. That is right.

Mr. SCHEUER. Competitive forces.

Once the labeling process gets the information in the public arena, in the public stream of commerce, let us say, then competitive forces might impel a manufacturer to get the toxic substance, whatever it is, out of there, because other manufacturers are going to compete with a product that doesn't have the asbestos, or whatever.

Dr. MCCANN. Like a product that is available now is nonasbestos gloves for hot work. When they are new, the asbestos gloves are not a problem, but when they get old and falling apart, you do get fiber release.

Mr. SCHEUER. Well, all right. Thank you very much for your testimony. I am sure you used that extra few minutes to very good avail. Thank you very much.

We will now have the final panel of artists who have been affected, and their physicians, Mr. G. Kaye Holden, with Dr. Peter

Spencer, Ms. Anne Laddon, and Dr. Sergio Fabro, and Ms. Toby Sedman and Dr. Robert Feldman.

Would all of you come up and take the stand? We have six members of this panel, and I understand that you plan to testify—we will ask Dr. Robert Feldman to testify first, because we understand Dr. Feldman has a plane to catch.

So, Dr. Feldman, would you proceed?

Now, all of your statements, your prepared statements will be printed in full in the record. So, you will be more than welcome just to chat with us casually for 5 or 6 minutes, each of you, and refer to anything that you have heard this afternoon from other panelists, other witnesses, or anything you have heard from myself or Congressman Rinaldo.

STATEMENTS OF TOBY SEDMAN, BROCKTON, MASS.; DR. ROBERT FELDMAN, PROFESSOR, NEUROLOGY AND PHARMACOLOGY, BOSTON UNIVERSITY; G. KAYE HOLDEN, NEW YORK, N.Y.; PETER S. SPENCER, PH. D., INSTITUTE OF NEUROTOXICOLOGY, ALBERT EINSTEIN COLLEGE OF MEDICINE; ANNE LADDON, ALEXANDRIA, VA.; AND SERGIO FABRO, MD., PH. D., PROFESSOR OF OBSTETRICS, GYNECOLOGY, AND PHARMACOLOGY, GEORGE WASHINGTON UNIVERSITY

Dr. FELDMAN. Thank you very much, Mr. Chairman and members of the subcommittee.

I think that for purposes of clarity in my comments, I would like to introduce Ms. Toby Sedman, who is sitting to my right. Perhaps Ms. Sedman could read her statement first, and then I might be able to comment further about it in elaboration of the issues that she will bring out in her comments.

If that is all right with you, Mr. Chairman, then I will ask Ms. Sedman to read her statement first.

Ms. SEDMAN. Mr. Chairman and members of the subcommittee, I want to thank you for allowing me the opportunity to participate in this discussion.

After my experience with lead poisoning, I feel an obligation to mankind in that it is a necessity to make the public aware of the traumatic reactions one can entail through the choice of a hobby.

Hobbies in most cases are an emotional release, something to enjoy. Yet, they can cause total devastation. The public does not research the hazards of his hobby when choosing it. The manufacturers do not state its pitfalls and surely the retailers could care less. We have left labeling to the discretion of the manufacturers for too long and this has proven useless.

It is time to force honesty on all involved in the manufacturing of such products.

In February of 1974 my husband visited someone who taught him how to make stained glass pieces. This entailed the cutting, wrapping, and soldering of the craft. When he returned home he then taught me. I first did this as a hobby. I did not check into the danger of the hobby, and when purchasing the materials no one told me of the safety precautions. I would clear a spot on the kitchen table, put some newspaper down to catch glass splinters, and off I would go creating the little trinkets.

As time passed, I had acquired several pieces and decided to investigate a way of selling them. This proved to be very profitable, and I found I needed a permanent work area.

Mr. SCHEUER. We are having difficulty understanding you. If you could speak louder.

Ms. SEDMAN. We went out and purchased a workbench and set it in our den on the wall our air-conditioning unit is on. The materials I used were as follows: Several pieces of glass, different colors for different designs; glass cutters; solder, 60 to 40 gage; one soldering iron; several strips of lead; one bottle of flux; paint brush; rags for washing and wiping the trinkets.

I learned how to cut the glass just like a jigsaw puzzle, wrap each individual piece in lead, paint the exposed sides that are going to be soldered together with flux, heat soldering iron, solder, wash and wipe each piece. The actual process could take anywhere from 20 minutes to several hours, depending on what type of piece was being designed.

As my business developed, I became more and more tired, yet due to the commitment to my new customers, I kept pushing myself. I often spent 10 hours a day to meet a deadline, blaming the exhaustion on a long-term viral infection.

I do feel lead is a habit-forming substance. The reason for this statement is: "No matter how I hurt I kept at it. Something would literally draw me to it."

After a period of time my fingers started to develop a tingling sensation. I was constantly nauseated and ached all over. I ignored this and went on with my chosen craft. The next thing that happened was my falling. It seemed I would turn my ankle. This is documented by several X-rays, taken at Brockton City Hospital. Each time being diagnosed as a sprained ankle. I became very short tempered, edgy, and seemed to have little control of my emotions.

It got to the point that my falling became an embarrassment. I went shopping in a fruit store. I was about to leave with a bundle in each arm when, lo and behold, my leg gave way. I fell to the floor, causing the fruit to spill all over the store. The proprietor yelled, "She's drunk. It's not my fault. You are not going to sue me." He gave me back my money and asked—no—demanded I leave. One, I don't drink, and two, at that point I felt dehumanized.

At that point, my husband insisted I seek medical care. I first went to a local physician who, after examination told me he could find nothing wrong and suggested I try keeping busy. His explanation was, "Your children are growing and need you less, so all your aches and pains seem more acute." I left his office only to repeat this three more times, getting the same response from the three other physicians I saw.

By now I had developed tingling in my fingers and often my hand would become rigid with my fingers in a clawed position. Because of this driving was almost impossible. My speech had become affected, also. I felt as though my tongue was twisting and my thought pattern had slowed down. I often had to think a sentence before saying it.

Another symptom that had occurred but went uncovered was my teeth. I started to develop a black line at the bottom of my teeth

and spotting on my gums. I saw the dentist. After his examination and taking X-rays of my mouth, he felt I had to lose three teeth. I feel this could have been misdiagnosed but this all was done prior to finding the lead poisoning.

The alarming truth of the discovery of my having lead poisoning is even more proof of the misconception that adults don't or at least rarely do get lead poisoning. Few physicians look for or even recognize the symptoms.

I am sure the question in your mind is, Did the physician you saw know what you were working with? Answer, yes. Each physician was made aware of this when I filled out posthealth information forms or during discussions after my examinations. As a matter of fact, one of the physicians ordered a glass fire engine for his grandson.

The discovery is even more overwhelming, and as I look back I am grateful to the world of pediatricians.

My youngster was due for a yearly physical. After his examination his pediatrician and I spoke. During our discussion, he asked what I was doing. He had heard I was trying to establish a small business. I can't remember exactly how it happened, but the next thing I know I was at our local nursing association having a blood test done for lead poisoning.

A few days later, I received a call from the nursing association. They suggested I see a physician. The lead count was elevated.

I called Dr. George Kirkland at Beth Israel Hospital, who saw me immediately. More blood work was done, and it was concluded that I have lead poisoning. All my aches and pains were finally real.

Dr. Kirkland then contacted Dr. Robert Feldman. The rest is my medical background, and Dr. Feldman is here to discuss that.

I want to make it clear that I am not here to damn the medical field or the manufacturers of such products. What I ask is that the proper labeling be enforced so as to make the public aware of the hazards involved.

Mr. SCHEUER. Thank you very much. Dr. Feldman?

STATEMENT OF DR. ROBERT FELDMAN

Dr. FELDMAN. Mr. Chairman, I think the story you just heard from Mrs. Sedman represents the example of how an individual naively can become a victim. When Mrs. Sedman came to me with evidence of elevated blood lead, and we were able to document the fact that she had an increased body burden of lead, treating her with chelation and documenting the improvement over a period of months, we began to look into the issues of how it became that way. The most striking thing is that all of the materials that she brought to me and that we examined, such as package labeling, did not have any warning whatsoever as to the hazards involved.

Mr. SCHEUER. What kind of materials were they?

Dr. FELDMAN. A bottle of flux, a package of materials with the lead calm that is used, the lead stripping.

Looking at references in the literature concerning toxic substances and hazards to hobbyists, we found many references that would indicate that lead was not a hazard to the hobbyist, and that one should not be concerned about it.

I might emphasize my relationship to Mrs. Sedman. I was her physician and neurologist. My work is in neurotoxicity, as professor of neurology and pharmacology at Boston University, and we are studying many of the health hazards that affect the nervous system, the central and peripheral, and I am very pleased that this bill does address the central nervous system and peripheral nervous system, as well as carcinogens, because not only does the fact that a substance can affect the nervous system produce a hazard to an individual, but in some instances the nervous system might be the marker for a substance which on more chronic use might be carcinogenic.

Mr. SCHEUER. A marker?

Dr. FELDMAN. A marker, meaning that if a person developed symptoms, neuropathic systems, for instance, of arsenic, that more long use, long-term use of the arsenic might prove to be carcinogenic.

I would like to simply emphasize several points, one of which is the recognition by phsyicians of symptoms which can be related to toxic substances, and that the education process of physicians is devoid of that type of emphasis in most medical schools or allied health areas. I think it is also absent in the education of the artists themselves.

This was very well proven to me recently in visiting New Hampshire's craftspersons' fair, when I spoke to several of the artists who used lead in glazes, or talked to jewelers, jewelry makers who do not understand that cadmium is involved in some of the processing, that they make jewelry with silver.

I also was impressed, in fact, shocked when I spoke to one anvil forger, a forging person who was working in an enclosed shed, inhaling carbon monoxide.

I think the issue is not just the labeling. It is a matter of education, so that in the process of labeling, package inserts as well as labeling can form a means of education, continuing education to the people who use the substances.

There are several different cases of artists who have come to me, and these are not necessarily craftspersons or artists, but simply individuals who are innocently performing some kind of hobby, and of course this would include one dentist that I had who came with weaknesses of the extremities, with lead poisoning, because he was making little lead soldiers and pouring them in molten lead, and he had no idea, even though he had been a professionally trained individual, that he was at risk.

Mr. SCHEUER. How is the lead ingested into the body? How does it get into the body when you are doing artwork or when you are making little lead soldiers?

Dr. FELDMAN. I think in Mrs. Sedman's case it was a matter of innocently inhaling the fumes that developed as a reaction to the heat and to the molten lead and the acid. Second, I think that the fumes, of course, can be inhaled into the mouth and swallowed.

I have had another patient who was in the business of making wiring and dipping wiring into molten lead. He just didn't wash his hands properly, and he would eat lunch while he was doing some of his work on the job, and he developed lead intoxication.

So, it is by inhalation, but mostly by swallowing and getting it from contamination. It is also brought into children and animals. As a matter of fact, people who are involved in the process of either working with lead or glass, it may involve their clothing, and their spouses and children and their pets sometimes get increased levels of lead from the exposure that is simply on their clothing or on their hands, and so forth.

I think the other issue of labeling should extend not only to the matter of lead, as we are talking about here, but I have had a young student in the Boston area who was using furniture stripper and found that not only was she refinishing furniture for herself, but she went into a little business for herself. She had no idea of the toxic potential of the stripping materials that she was using. She developed an acute halucinogenic effect from the methyl chloride and other solvents that she inhaled in the substance she was using.

Another example of the misunderstanding or the underestimation of the toxic substance was found in another of my patients who was an auto rebuilder as a hobby. Now, this isn't the mechanic. Mechanics sometimes know about it, and work places are more concerned about it.

I think OSHA and the NIOSH emphasis has made an effect on that, but this man went out and bought a bottle of trichlorethylene that he was using in order to help wash off the grease from the carburetor and clean up the engine of the car he was rebuilding. This young man developed a severe effect of numbness on his face and unsteadiness of walking and peripheral neuroxy from trichlorethylene.

So, in summary, I would simply like to say that the bill does have what I would consider to be the necessary emphasis in making known to the potential user and therefore the potential victim of his hazards, the risks that he might undertake, and therefore have to have cautions about doing so.

I would certainly support the passage of the bill based on labeling of ingredients, but I would also encourage that the manufacturers enclose instructions in the package insert of some sort that would tell people about how to avoid all of the toxic substance.

Thank you, sir.

Mr. SCHEUER. Thank you very much, Doctor and Ms. Sedman.

Now we have two more groups of panelists, Mr. Kaye Holden and Dr. Spencer and Ms. Laddon and Dr. Sergio Fabro. Why don't we start out with Mr. Holden and Dr. Spencer? Are you appearing sort of jointly?

Dr. FABRO. I am jointly with this lady.

Mr. SCHEUER. You are separate?

Mr. HOLDEN. Separate but related.

Mr. SCHEUER. Why don't we hold questions until then?

STATEMENT OF G. KAYE HOLDEN

Mr. HOLDEN. Thank you, Mr. Chairman, distinguished members of the subcommittee.

I have been a full-time professional artist since 1962, and attended art school 3 years prior to that. Virtually every day from the time I started classes I have been in contact with oil paints, turpen-

tines, and mineral spirits used in thinning the paint and for cleaning my brushes.

In the midseventies, after I had been painting for 15 years or so, I began to notice I was feeling rather tired all the time and, more importantly, my energy to create and work seemed to be waning. I didn't suspect anything particularly wrong; I was getting older, of course, I wasn't sick, and I didn't hurt any place, but I thought I had better check it out anyway.

I went to a doctor in Middletown, N.Y., where I was living at the time. He examined me pretty thoroughly, and then immediately put me in a hospital for more tests, and called in a kidney specialist. What they learned was that I had "end-stage chronic glumerialnephritis." In other words, the doctors told me I had a potentially fatal kidney disease.

I asked my doctor what I could expect and he told me that the best would be they could arrest the disease, leaving me with a kidney function of about 40 percent, the worst would be that I would be on dialysis within 6 months. He did stress the point that they would never get better.

No one seemed to know what had caused my kidney problem. There was no history of any serious childhood disease like scarlet fever, nor any adult contagion that seemed a likely cause. No one in my family had ever suffered any problems with their kidneys or much else; I come from long-lived people.

When I asked my doctor what could have caused it he shrugged and said that he didn't really know. My first instinct was to suspect my artist materials. I knew that white lead pigment, for example, was bad for you, and I knew that a certain green pigment had arsenic in it, but I didn't use either of those things—indeed, I was careful to avoid them. Besides which, those pigments had side effects which bore no relationship to my disease. But I still felt uneasy. After all, every day for much of my adult life I have been handling my paints and breathing the fumes.

I asked my doctor what he thought, did my disease come from my paints? He told me he had never heard of oil painting causing kidney disease. When they had done the biopsy while I was in the hospital—when they actually took out a piece of diseased kidney to look at—my doctor said there seemed to be nothing in the cell damage to lead him or his colleagues to think the paints had anything to do with it. He led me to understand that if I had swallowed a cup of paint thinner, the biopsy would have shown a certain type of kidney damage. That's what they looked for, among other things. I didn't have it, but of course I hadn't swallowed any paint thinner, either. He told me I could continue painting.

After getting out of the hospital, I returned to work and every month or two I would go back to my specialist to see how I was doing. And the news was never good. My kidney function was getting worse every month. He explained to me that the million or so tiny filters in each kidney, the glumerei, were dying by the hundreds every day.

The doctor said what I had was an "autoimmune" disease, which meant that my own immune system was attacking my kidneys. I was shown the report presented by the pathologist who made the diagnosis from the biopsy. One word he used was "gangrenous."

There was gangrene going on inside my own body. Each filter would undergo an attack by my own white blood cells and when it would heal it would scar over and shut forever.

By 1977, 2 years later, I was in pretty rotten shape. By then, I had been put on a restricted diet affecting everything I ate or drank. I was tired all the time. My body was bloated from the medication they were giving me in an attempt to slow the destruction.

Not long ago I looked at a photograph that I had taken about that time. I had planted a garden and I was very proud of a large red tomato I had grown. My wife took a photo of me grinning holding this tomato. I look at that photograph now and I see my face looks so much like the tomato, both big and red, and I couldn't see at that time how really ill I was.

My blood pressure which had been normal all my life had to be controlled by more medication. Because my kidneys could no longer produce the right hormones, my red blood cell count was going down. My bones were losing calcium. And because of some of my medication, I would catch any cold or flu which passed through town. Although I tried to dabble a bit with my paints each day to keep up my spirits, I could no longer contribute to the support of my wife and myself. I had to go on disability. I received something in the order of $215 per month.

I was grateful for that, but of course it didn't go very far.

In the spring of 1977, we moved to Detroit, because my wife had been offered a better job there with more pay. I became a patient at Henry Ford Hospital there. Dr. Nathan Levin, who is chief of nephrology at Henry Ford, took my case. His reaction to my disease and my painting was about the same as I had gotten in New York; a shrug and a declaration that he had never heard anything about oil paints or paint thinners hurting the kidneys either, but he did make an interesting point.

He said:

> We don't really know very much about some kinds of kidney diseases and what causes them. One person might have a zero susceptibility toward certain things and the next guy will have a 100-percent susceptibility to the same things.

About a month later, July, I think, my new doctor handed me a report from a medical journal which had just been published. Dr. Theodore Ehrenrich, a kidney specialist working out of Mt. Sinai Hospital in New York, had noticed a relationship between artists working with oil paints and paint thinners and kidney disease. Most of the report was in technical language, and I had to have it explained to me, but the essence of what he said was that repeated "small insults" to the kidney over a long period of time seemed to set off the body's immune system with the result being the kidneys were destroyed by glumerialnephritis—my disease. Not only my disease, but exactly my history. My own body was destroying my kidneys.

Sadly, Dr. Ehrenrich went on to report that once the disease was in an advanced stage, it appeared irreversible and unstoppable.

Well, the news came too late for me because by that time I couldn't paint any more anyway. I had by then all the symptoms of advanced kidney failure. For example, I was nauseous all the time. What food I was allowed to eat turned my stomach. I had no

energy for anything, and spent most of my day on the sofa, often too tired to read.

I would like to tell you how I felt. Most of us have stayed out much too late on a Saturday night and had a drink too many. Recall how you feel the next morning: tired all over, a vague nausea, the brain fuzzy and not functioning very well, but knowing that if you take it easy all day Sunday and sleep well that night, you will be fine on Monday.

Well, a good night's sleep never fixed me up; the tiredness, the nausea, the fuzzy brain never went away. The hangover never went away.

All this was hard on my wife, Janet, too. I am sure you can imagine the horror of watching her loved one slowly lose his grip on life, not knowing whether he would live or die. Our life by then consisted of not much more than a bland dinner and a few hours of television. At night we shared only desperate thoughts in the marriage bed because my medication and my disease had pretty much killed sexual passion.

This was how the summer of 1977 passed for me. On my visits to the doctor, which were weekly by then, I would pass the room in the hospital where kidney patients were being dialysed. There they would lie in rows with two needles in their arms letting a machine do the job that their kidneys could no longer do, spending 3 to 4 hours three times a week plugged into a machine so they wouldn't die.

It was a terribly depressing sight for me because I knew that pretty soon I would have to join them. On September 6, 1977, 4 days after my 44th birthday, I joined them.

For me, a happy part of this story is that I eventually received a kidney transplant from a cadaver whose antigens closely matched my own. The transplant was successful, but even now, more than 2 years later, my doctors still won't guarantee it will last forever.

And would you like to know what my doctors now tell me about oil painting? "Well, there really isn't much evidence," they say. "I think you can go ahead and paint." You know, it sounds to me a bit like the doctors in the employ of the tobacco companies who insist that no one has ever proved that cigarettes cause lung cancer. My doctors, of course, have no paid motive to discount a certain finding. I believe they are truly interested in my welfare. They just don't know for sure, and how is some poor artist supposed to know?

What I do know for sure, Mr. Chairman, is that I won't go near a tube of oil paint or a can of thinner. And I also know this: back in my student days, if I had picked up a tube of oil paint, or a jar of turpentine, or a can of paint thinner, and read that the contents might possibly—possibly, gentlemen—cause kidney failure—I may have bought it anyway, but I would certainly have protected myself by using a ventilating fan and wearing gloves, or maybe I might have learned to use watercolors, or acrylics, or become a sculptor. Or I might not have become an artist at all.

Mr. SCHEUER. What about outside? Can you paint outside?

Mr. HOLDEN. That is hard to do in the wintertime. There are many things I might have done otherwise. I might have even tried

to run for Congress, but chances are, that is far worse for your health than being a painter.

I don't know how long my new kidney will last. It could stop tomorrow or it could last me until I'm 94, like my grandmother. I think about it every night when I go to bed. And speaking of going to bed, I no longer share it with my wife. The disease spread from my kidneys to my marriage. None were able to survive.

Thank you. If you have any questions, I would be glad to answer.

Mr. SCHEUER. I have no questions. You have given us a very moving and very troubling testimony. I don't know whether I could take being a Congressman if I had to listen to testimony like this very frequently. You have had a devastating effect on us.

I am sorry Congressman Richmond wasn't here to hear it. Even as the author of this legislation, he might get an enhanced perception of the urgency and the value of the enormous effort that he has already put into this. I am sure he feels, in addition to the shock and horror that I feel, a tremendous feeling of satisfaction that at least for those who follow this in the future, this pitiful and pathetic experience that you have gone through may become avoidable.

I thank you very much for your testimony. As I say, it has had tremendous impact on all of us. Thank you.

Mr. HOLDEN. Thank you.

Mr. SCHEUER. All right. We will talk to the next witness, Dr. Peter Spencer.

STATEMENT OF PETER SPENCER, PH.D.

Dr. SPENCER. Mr. Chairman and members of the subcommittee, my name is Peter Spencer.

I am an associate professor of neuroscience and director of the Institute of Neurotoxicology at the Albert Einstein College of Medicine, Bronx, N.Y. I received a Ph. D. in pathology from the University of London, London, England, in 1971, came to this country in 1972, and was naturalized a United States citizen in 1978.

During the past 12 years, in my capacity as a research scientist, I have authored approximately 150 papers, chapters, and abstracts, the majority of which relates to neurotoxicology. I have also coedited a recently published textbook entitled "Experimental and Clinical Neurotoxicology," Williams & Wilkins Co., Baltimore, Md., 1980, a copy of which has been furnished to this subcommittee.

It will be apparent from the foregoing that my professional interest and expertise center on neuroscience and neurotoxicology, academic disciplines which seek to determine how the nervous system works and why it malfunctions when subjected to toxic insult. While I have no special relationship with artists, or have extensive knowledge of their professional activities, many of the chemicals used in arts and crafts, and listed in Dr. McCann's book, Artists Beware—Watson-Cuptill Publishing, New York, N.Y., 1979—are capable of damaging the brain, spinal cord, and nerves of man.

Some of these compounds, the neuroactive type, can act like drugs on the nervous system to produce changes in brain function of short duration. Others, the neurotoxic type, can exert their effects slowly and insidiously, and cause structural breakdown of

nervous tissue resulting in a wide variety of neurological diseases which often mimic naturally occurring conditions.

Greater than 70 percent of the 28 artists' materials introduced by Mr. Richmond contain potentially neurotoxic or neuroactive chemicals. These include the organic solvents hexane, toluene, and xylene, and the metals manganese, cadmium, mercury, and lead.

My testimony focuses on the organic solvents for the following four reasons.

First, these compounds are used by artists to dissolve or thin oils, waxes, varnishes, and paints, and to clean brushes, rollers, silk screens, and hands. They vaporize readily, and significant concentrations may build up in air if the working environment is inadequately ventilated. They may then be absorbed by the lungs in sufficient quantities to produce short-term effects which may impair normal brain function, and, if the airborne concentration and duration of exposure are sufficient, long-term changes characterized by damage of brain, spinal cord, and nerves. Organic solvents are also absorbed by the skin.

Second, organic solvents can be abused. Susceptible individuals exploit the neuroactive properties of these compounds by deliberately inhaling solvent vapors to obtain a "high," only to discover subsequently that this practice has also induced chronic neurological disease. This statement should not—repeat, not—be taken to imply that artists are more vulnerable to solvent abuse than any other human group, except in the sense that artists may have special access and unusual exposure to these compounds because of the demands of their work.

Third, a type of neurological disease, called peripheral neuropathy, has been well documented following prolonged occupational exposure to certain organic solvents. The disease, which predominantly affects the spinal cord and limb nerves, has been experimentally reproduced and extensively studied using animals, and tissue culture models of the nervous system.

Fourth, a second type of neurological condition, termed organic mental syndrome, has been reported by Scandinavian and Finnish health professionals in painters and furniture finishers after many years of exposure to an ill-defined mixture of organic solvents.

Why are artists potentially vulnerable to solvent neurotoxicity? Four reasons are apparent: First, they may have no knowledge or warning of the potential hazards of repeated exposure to solvents. Second, they may be likely to have unprotected skin contact with these compounds. Third, the artist's studio may be inadequately ventilated, and respiratory protection may be inappropriate or not worn. Fourth, because of the nature of their profession, artists may be inclined to work for extended periods in contact with solvent-laden air, or, in the case of an artist working with solvents in the home, may be exposed on a more or less continuous basis. This is an especially important point to grasp, because we believe that an individual's susceptibility to solvent neurotoxicity is closely related to the duration of exposure, as well as the airborne concentration of the solvent and other factors. For example, animal studies have shown that 5-to-10 times lower concentrations of one solvent are required to induce nervous system degeneration in continuously exposed rats, in comparison to animals exposed for periods equiva-

lent to the normal human working week. Furthermore, the problems of an artist's potential exposure to solvents in the home is amplified by the additional danger of possible exposure of other family members and unborn children.

The organic solvent hexane, which is listed as present in 4 of the 28 compounds introduced by Congressman Richmond is one of the more closely investigated of the neurotoxic solvents. Commercial hexane is a mixture of solvents, all of which have neuroactive properties that can induce reversible lightheadedness following brief periods of exposure to high airborne concentrations. The compound normal hexane is the only constituent of commercial hexane known to cause structural damage to the nervous system following prolonged exposure to sufficient concentrations of the solvent. Table 32.1 of my book that I have furnished to the committee shows how normal hexane, often in combination with other solvents, has been associated with several outbreaks of peripheral neuropathy; for example, among cabinet finishers in the Bronx, shoe-makers in Europe, sash cleaners in Japan, and solvent abusers in many countries. Affected individuals usually experience a gradual onset of fatigue, abnormal sensations, and weakness of the limbs, and, if exposure is maintained, eventually may be unable to grasp objects or walk.

I would now like to turn the subcommittee's attention to the Scandinavian and Finnish experience with the neurotoxicity of industrial solvents, the subject of an international conference held last May in Copenhagen.[1] It is believed by many health professionals in these countries that 10 or more years of occupational exposure to a number of ill-defined industrial solvents has induced in certain housepainters, carsprayers, varnishers, and cabinet makers, an organic mental syndrome characterized by irreversible memory impairment, personality change, irritability, apathy, anxiety, and headache.

To my knowledge, this association between industrial solvents and an organic mental syndrome is not recognized or accepted in the U.S., although there is a report [2] of a self-employed commercial artist who developed reversible impairment of recent memory and neuropathy, coupled with mild ataxia, during her work with silk-screen processes.

It must also be stated that evidence of cause and effect, and a convincing demonstration of brain disease, have yet to be presented by the Scandinavian investigators. Nevertheless, it is noteworthy that one Danish paper [3] identified the compound tetralin as a minor constituent of one of the implicated solvent mixtures. One variety of this compound, known as A.E.T.T.—full name, acetyl ethyl tetramethyl tetralin, and the subject of chapter 20 of my book, produces widespread neuropathological and behavioral changes in experimental animals.

Between 1955 and 1977, A.E.T.T. was widely used as a fragrance in soaps and perfumes, but was voluntarily withdrawn from further use when the U.S. fragrance industry found, with my help,

---

[1] Workshop on the Neurotoxicology of Industrial Solvents, Hotel Mariana, Vedbaek, Copenhagen, Denmark, May 29–30, 1980 (proceedings not published).

[2] Molhave, L., Lajer, M. (1976) Organic solvents in the air inspired by painters. Ugeskrift for Laeger 138, 1230–1237.

[3] Prockop, L.D. (1978) Neuropathy in an artist. Hospital Practice, November issue, pp. 89–92.

that the compound was neurotoxic when repeatedly applied in high concentrations to the shaven skin of rats—Spencer and other, series 204, 633, 1979.

I relate the A.E.T.T. story for two reasons: First, because I was contacted by the representative of an individual whose hobby was to make perfumed candles containing A.E.T.T. and other compounds, and who allegedly had developed mild neurological impairment; and second, because solvent mixtures used by artists and others may contain compounds related to tetralin, such as those listed in table 20.2 of my book, which reportedly share some of the biological properties of the neurotoxic agent A.E.T.T. Many years of research lie ahead to determine whether or not these tetralin-related compounds also represent a neurotoxic hazard.

In summary, I have singled out some of the organic solvents from the many neurotoxic compounds presently in use in, but not restricted to, arts and crafts materials. It is my opinion that such compounds, if improperly used, may represent a hazard to the artist. I believe it is desirable, therefore, to identify clearly on labels attached to artists' products: One, the known toxic effects of their constituents; and two, guidance on the safe use of the product.

I would also like to take this opportunity to point out to the subcommittee that although the human brain is the unique attribute of man and a very common target of toxic chemicals, our apparent national preoccupation with linking toxic chemicals to cancer may have obscured the importance of research in neurotoxicology. It has been my personal experience that major industries and their representatives have taken the lead in funding research in this area, and that the significant resources urgently needed have yet to be provided by agencies of the Federal Government.

Thank you.

Mr. SCHEUER. Thank you very much, Dr. Spencer. Thank you for giving us a copy of your book, which I am sure we will use to very good advantage.

Right now we will go to the last two witnesses, Ms. Anne Laddon and Dr. Sergio Fabro.

Now, let me explain to you again that your prepared statements will be appended in full in the record, and I urge you not to read your testimony, but to simply give us the highlights. If you feel comfortable with that, I would ask you to keep to 5 or 6 minutes.

STATEMENT OF ANNE LADDON

Ms. LADDON. I will go as quickly as I can.

Mr. SCHEUER. And pull the mike up so that we can hear you.

Ms. LADDON. I am a silk screen artist in Alexandria, Va. I have been a professional silk screen artist for the last 7 years.

Just to go quickly through it, I use a lot of very toxic chemicals in silk screening, probably the worst printmaking method of all. I use toluene, varsol, paint thinner, turpentine. You name it and I use it.

The process, in general involves leaning over a silk screen with inks on top of it. I lean over it all day, forcing the ink through a stencil onto the paper underneath, and producing multiple copies. The ink dries by evaporation racks, or hanging from clothespins,

and I am breathing evaporated fumes from inks. I use oil paint, oil base inks, and probably one to two quarts of ink per color, three colors a day, and I am exposed a lot.

Anyway, to get very specific about it, about 3 years after I started silk screening, I started getting stomach aches. Every afternoon I would have the same stomach ache, and I began to think that there was something wrong. I went to my doctor. He gave me a lot of tests and said, "There is nothing wrong with you. You are fine. You have a nervous stomach, and you should take some Malox for it."

Then, a few months later I started getting headaches along with the stomach aches. I tried transcendental meditation, and that didn't help.

Let me see now. Where was I? I skipped over a lot.

Mr. SCHEUER. You are doing extremely well.

Ms. LADDON. I am going very fast. These previous testimonies were so moving, I really can't hold a candle to them. I didn't get as sick as they did, but I had two miscarriages, and the miscarriage was the last straw. I went to see Dr. Fabro when I was pregnant the second time, because by that time my lungs were blasted out. I could hardly breath. I was worried to death that there was going to be something wrong with this fetus, and sure enough, I lost the baby a few weeks later.

He was very frank with me. He said, "we don't know. We don't know whether what you use in your work has anything to do with it, but I am suspicious." I really feel that these chronic health problems I suffered for 4 or 5 years were work related. The minute I stopped silk screening—well, not the minute, but 4 or 5 months later, I felt great.

Mr. SCHEUER. I am terribly impressed by your testimony.

Ms. LADDON. It was quick.

Mr. SCHEUER. This is a very impressive group of witnesses, all of you, but one feeling I get is that this hearing is as much an indictment of the medical profession as it is of the chemical industry. I am absolutely flabbergasted that you told me that after this devastating sickness of yours, and after your transplant, the doctors tell you you can go back to painting. I mean, like the Bourbon kings, they seem to have learned nothing, and forgotten nothing. You were telling me the same thing.

Ms. LADDON. I want to tell you a few more things, too, and then I will be quiet, really, but I am not your normal uninformed kind of flaky artist. I am really careful. I wear my little gas mask all the time, and I always have, and I wear my rubber gloves, but that wasn't enough.

What had to happen was, I had to get really, really sick, and I talked to Dr. McCann a couple of years ago, and when I had the miscarriage, I realized that it was time to tear the studio apart and to completely ventilate it properly. I hired an engineer. I spent $2,500 on this exhaust system.

That is why I am OK today, I think, because I finally got smart. But I had to get sick first, and I had to suffer for 4 or 5 years from all these kinds of ambiguous chronic illnesses. I wish that I had known. And I read my labels. But I don't understand the dangers. They say things like what it contains.

For example, this tube of oil paint. This is my favorite color of red which I brought along to show you. It says, "Ingredients: Cadmium, sulfocylinide precipitate, barium sulfide, purified, refined linseed oil," period. There isn't another thing on here. How am I supposed to use it? I don't know. Is it bad for me to breathe it while it is drying? I am scared to use it now. I thought it was safe.

But we artists need much, much better information, and the art stores don't supply it. For instance, this gas mask. I didn't buy this at the art store. I bought this mask from a special auto body paint shop, after much searching around, I finally got a mask that fits my face. But try and wear it for 4 or 5 hours. It is very uncomfortable, and that is why most of my buddies who are printmakers don't bother, and they are getting sick. That is because they don't really believe there is anything dangerous in our printmaking supplies. The labels don't warn them.

Anyway, I could go on and on, too. But I think that is it. The main thing I want to stress is, if this is the red I want, I am going to buy it. I just want to know how to use it safely. I don't want the manufacturers to feel scared to death that if they put on there it is going to cause all of these things, that we won't buy it. I think the professional artists will continue to buy the materials that they need to produce their results, but we just need a lot more information on the label.

Thank you very much.

[Ms. Laddon's prepared statement follows:]

ANNE LADDON DESIGN

September 16, 1980

Subcommittee on Consumer Protection and Finance
on H.R. 6977

I am a silkscreen artist in Alexandria, Virginia. Silkscreening has always fascinated me and it became my hobby nine years ago. For the past seven years it has been my sole occupation. It is a perfect medium for me because I am able to use many layers of brilliant colors, with an end result not attainable in other printmaking methods. I presently support myself entirely from the sale of my original silkscreen prints.

A few years ago I developed chronic health problems, and eventually concluded that these were work related. At that point I stopped printing, did a lot of reading on the subject, rebuilt my studio, and I'm now healthy and symptom free. However, I suffered for over four years from chronic headaches, stomach aches, and breathing problems.

I'd like to describe for you my working area. I work in a 16' x 22' room at the Torpedo Factory Art Center in Alexandria, Virginia. It was once a WW II ammunition plant and has not been renovated. Since I'm in the center of the building, I have no outside windows, no access to fresh air, no plumbing, no air conditioning, and little heat.

To control the fumes in my studio I had a ventilation system installed at considerable expense--over $2000. Few artists could spend that. Due to the number of artists working in the building and the ancient wiring, the use of my exhaust system is unpredictable. I recently had a special electrical circuit installed to remedy this problem, at an additional cost of $350.

Even with my rather poor working environment, I am probably better off than most artists who silkscreen at home in a bedroom or basement...sending fumes all over the house.

The silkscreen process is a handprinting method which produces images in quantity, by forcing ink through a stencil one color at a time, on to paper. Each of my prints has 30 or more colors, each color being a separate ink application. In a six week period I produce about 140 prints with 30 to40 colors. I usually make the stencils one at a time from a lacquer base film by cutting open areas in the film where I

101 North Union Street, Studio #28, Alexandria, Virginia 22314

want the color to appear. Then I adhere the stencil to a silkscreen with a lacquer thinner. Next I mix the ink. For this I use oil paints and inks to which I add paint thinners, extenders, turpentine, linseed oil, whatever I need to get the shade I want. Each color requires one to two quarts of ink for 140 prints. Next, I force the ink through the stencil with a squeegie onto the paper. The ink then dries by evaporation in racks. Then the messy part begins...cleaning up. I usually wear a gas mask and rubber gloves for this part...where I first wash out the ink with varsol, and then remove the stencil with a strong lacquer thinner. I pour the liquid over the dirty screen and scrub with rags until clean. During the entire process I am leaning over the screen area either printing or cleaning up, and there is plenty of opportunity to inhale those fumes. The elapsed printing time is around 3 to 4 hours. In addition the inks take anywhere from 1 to 10 hours to dry and fill my studio with evaporating solvents. Even with exhaust fans going and my mask on, I can't escape entirely.

Now, about this gas mask I use. It's an organic vapors mask which I found at an auto body paint shop. It is designed for a man's face, so it is uncomfortable for long periods of time...not to mention the customers who leave at the sight of it. My rubber gloves I buy at Safeway and they seem to work well for some solvents while others seem to sweat through the rubber. I have never seen either mask or gloves at the art store where I buy my supplies.

When I was teaching silkscreen printing, which I did for three years, I tried to get information on health hazards to inform my students. It was then that I realized how very little is available easily, and the standard printmaking texts mention nothing. When I suggested purchasing a mask and gloves to my students, the first question was "How much will it cost us?". The $25 investment was too high for all but a few who, like my printmaking friends, prefer to "take their chances" than to be bothered with the expense and inconvenience.

So, you see, my silkscreening involves a lot of solvents and materials about which little is known. (such as lacquer thinner, varsol, turpentine, screen wash, photo films, oil paints with barium, lead, cadmium, etc.) In the beginning I bought my materials and used them without much thought about whether they were dangerous or not. If I got a strong whiff of something or a headache, I went outside for a few minutes, and then I returned to work. After a year or so I began to wear the mask and gloves, 'just common sense' I told myself. For some years I didn't do much else...not until I got sick.

101 North Union Street, Studio #28, Alexandria, Virginia 22314

ANNE LADDON DESIGN

Then about five years ago I began to experience almost daily stomach aches. I cut out certain foods, thinking I was allergic, but that didn't help. I went to my family doctor thinking I had an ulcer...after tests he said I was "fine", dismissed it as a nervous stomach, and told me to take some maalox tablets. But the stomach aches continued, now accompanied by headaches, and I tried transcendental meditation, thinking I needed to relax. But it didn't help either. Later I began having breathing difficulties, asthma, and allergic reactions to my solvents. During this time I had the second of two miscarriages and consulted Dr. Fabro. We discussed the possible connection between my work and my miscarriage.

By this time I had begun to suspect that my health problems might be related to my work. But it had taken me four years to realize it! When I began to read literature on the subject I discovered that my solvents were known to cause symptoms just like mine.

To be frank, I was furious. I was very angry to discover that my art supplies, even though used sensibly, were directly affecting my health. (When I stopped printing and stayed out of the studio I improved.)

I said I used my materials sensibly. By that I mean that I throw out my rags and oily papers daily, I store them in covered containers, I have always used a table fan or exhaust fan to circulate air, I often wear a mask, and always wear gloves. But that was not enough to protect me. I needed more information about how to use the products. For instance, the phrase "Use with adequate ventilation" to many people means "near an open window". I was to discover that I needed 15 air changes per hour, with the exhaust at my work table!

I read my labels. On Cadmium Vermillion oil paint it states "Ingredients: Cadmium Sulfo-selenide co-precipitated with Barium Sulfate ground in Linseed Oil.". Period. Nothing else. Is this product safe to use? I'm not a chemist, and I have no idea how to use it safely. The label doesn't tell me.

I don't want to give up silkscreen printing. I love my work. All I want is information on how to use the products safely.

101 North Union Street, Studio #28, Alexandria, Virginia 22314

Mr. SCHEUER. A lot more information about how to use it safely, or at least minimize the risk.

Ms. LADDON. I don't care what is in it. I don't care. I want to know how to use it safely. Does that mean work near an open window? Does that mean, like it does for me in silk screening, 15 air changes per hour? That is a lot of air changes.

Mr. SCHEUER. Is that what they tell you?

Ms. LADDON. That is what Dr. McCann and an engineer that I spoke to helped me do to my studio, and now I think it is pretty safe. I feel better.

Mr. SCHEUER. You have been a wonderful witness.

We will now go on to the last witness, Dr. Sergio Fabro, and if you, too will please summarize your statement.

STATEMENT OF SERGIO FABRO, M.D., PH. D.

Dr. FABRO. If you will excuse my broken English, I will try to summarize my statement. Ms. Ladden come to my office about 2 years ago. She was very much concerned about her pregnancy. At the examination I found her to be approximately 6 weeks' pregnant and she complained of some vaginal bleeding.

Mr. SCHEUER. Is this the second pregnancy?

Dr. FABRO. Yes; you are correct. This was her second pregnancy. As I have mentioned, she was very much concerned about her pregnancy. She gave me a list of some 14 commercial products that she had been routinely using. These products contained a variety of solvents including toluene and xylol.

In her past medical history, if I remember correctly, she has been always very healthy. She had one previous spontaneous abortion and she had a past history of asthma. Although I expressed my concern about her present pregnancy, I told her that I did not know whether her pregnancy will go to term or not. Thus bleeding during the first trimester of pregnancy is not an uncommon symptom for patients who have successfully delivered at term.

I explained to her what we know about the frequency and causes of spontaneous abortion. Finally I told her that it is not known whether the chemicals to which she was exposed during pregnancy could cause spontaneous abortions in the human.

Mr. SCHEUER. It is interesting that she said when she stopped all of this, within 5 or 6 months all of her symptoms disappeared. Is that a correct statement?

Ms. LADDON. Pretty much.

Dr. FABRO. I would like to make a comment about the feeling of fatigue and headache that Ms. Laddon suffered when exposed to the chemicals she has mentioned. I would like to point out that these symptoms are rather common when someone is exposed to solvents in nonventilated environments.

Mr. SCHEUER. When you say a nonventilated environment, I want to ask you a question. I would like to ask it of all of the members of the panel, particularly the two doctors. We have heard several of you testify that the warnings issued by industries, like "Use with proper ventilation," are inadequate. How can we make sure that the labels on art supplies will be sufficiently detailed to tell you whether 16 times an hour is right?

To me, if you said once an hour, that would seem like a lot. How do we insure that the Consumer Product Safety Commission for each product will put on there precautions to be taken in sufficient detail so that people can protect themselves? I mean, just to say, "Use with adequate ventilation," is really not very helpful. How high is up and how much is adequate?

Ms. LADDON. I think it should be more than adequate, more than "Use with adequate ventilation," because to me that didn't mean anything more than an exhaust fan across the room and an open window. I think for silk screen supplies it should be specified that if you are going to use this product safely, particularly in school, if you are going to use the silk screen product safely, then a little brochure ought to come out with those inks. It could be very simple. It would say, for a 12-by-12-foot room, you need this kind of a fan at the window, and it should have a ductwork that goes to the printing area, so that it blows fresh air in front of your face and the toxic air out.

What I was doing in the beginning, when Dr. McCann caught me was: I had an exhaust hood, and a fan over my head, and I was leaning into the paints and silk-screening away happily and blowing all the horrible fumes right up into my face.

Mr. SCHEUER. You mean you had a fan that sucked it up.

Ms. LADDON. I had a lot of systems before I finally got a good one. We went through three or four systems. Finally, I understood that the fumes have to go away from your face, that they are heavier than air, and a number of details that could be written in a page to silk screen artists, but it took me months to find that all out.

Dr. FABRO. The critical question is how to convey the right information to the consumer, at the right time. At present, this subject is highly controversial. In the case of Ms. Laddon, I believe that prevention of the side effects experienced by her could have been achived if she would have been properly educated prior to the use of potentially toxic chemicals. In this respect I strongly believe preventive education is likely to have far greater effectiveness than product labeling.

[Dr. Fabro's prepared statement follows:]

Testimony of Sergio Fabro,M.D., Ph.D. before the
Subcommittee on Consumer Protection and Finance on H.R.6977

Hearing of September 16, 1980 (10:00AM), Room 2322 of
the Rayburn House Office Building

Mr. Chairman, Members of the Committee, thank you for giving me the opportunity to testify on the possible adverse effects of our environment on reproduction.

I am a Professor of Obstetrics and Gynecology and of Pharmacology at the George Washington University and I practice Obstetrics and Gynecology within the framework of my University appointment.

Ms. Ann Laddon was a patient of mine who, early during her pregnancy, came to my office on November 14, 1978 with the complaint of some vaginal bleeding.

She was deeply concerned about the normality of her pregnancy, particularly because of her occupational exposure, as an artist, to a variety of chemicals. She gave me a list of some 14 commercial products that she was using in her work and she was wondering what effects they might have on her pregnancy.

From my examination, she appeared to be a healthy woman in her 6th week of pregnancy. She has an unremarkable past history, except for a previous early spontaneous abortion and bronchial asthma.

Although I expressed some concern about the viability of her pregnancy, I made it clear to her that it was too early to tell whether or not the pregnancy would continue to term. After discussing with her causes and incidence of spontaneous abortions, I prescribed rest and no

medications.

Mr. Chairman, Members of the Committee, Ms. Laddon's concern about possible harmful effects on the unborn child of maternal occupational exposure to chemicals is not an isolated example. In recent years, I have become increasingly involved in this type of patient counseling and have served as a consultant for a number of Regulatory and Governmental Agencies. The fact that we are here today is probably the most clear demonstration that our Society has come to recognize the dynamic complexity of man-made environmental changes and the possible harmful effects of these changes on human reproduction. When this awareness is combined with an increasing recognition of significant reproductive wastage in the human population, one can easily understand why chemical exposure of the mother during pregnancy is one of the pressing environmental problems we are facing today. Human reproductive wastage is not only significant, but in most cases, its etiology is poorly understood.

Using conservative estimates, for every 3 million live births per year in the USA there are approximately 600,000 abortions, and some 24,000 fetuses die in utero. Of those who are born alive, about 8% are premature, and some 10% have a low birth weight, with another 90,000 possessing some type of congenital malformation. In this country alone, about 30,000 babies per year die during the first 4 weeks of life, and some additional 26,000 do not survive into the beginning of their second year.

Although these figures are well established, the cause of this reproductive wastage is far from being understood. In particular, it is not clear how important a role environmental or occupational exposures play. Congenital heart disease is a frequent congenital abnormality occurring at a rate of about 4-5 per thousand live births, and it is a leading cause of neonatal and infant mortality. Despite the frequency with which

this defect occurs, our understanding of its cause(s) and mechanism(s) is very scanty. For only 5% of the cases can we infer a genetic, metabolic or an exogenous environmental factor. The etiology of the remaining 95% is unknown. In absolute numbers, this means that every year about 15,000 new babies are born with a significant heart abnormality and for 14,250 of them cannot find an apparent cause.

Similarly, a large proportion of the cases of abortion, stillbirth, prematurity and intrauterine growth retardation has an unknown etiology.

Indeed, one is left to wonder what part the environment plays in determining at least a proportion of these defective offspring. Although it has been estimated that environmental factors may be associated with 6-11% of developmental defects, for some 60% of these defects we have no explanation. Furthermore, intrauterine death or low birth weight are only the most obvious manifestations of abnormal human reproduction. We must add to them the offspring who seem perfectly normal at birth, but who later in life are afflicted with mental retardation or suffer from transplacentally-induced disease including cancer, hypertension, and infertility. At the present time, most of the evidence for this type of subtle toxicity is derived from experiments in animals. The extent of this problem in the human population is unclear, and represents an area of active concern, a challenge to future investigations.

In a clinical seeting, it is essential to clearly convey to the patient this type of information and to emphasize to her that our knowledge as to the possible role played by environmental factors is incomplete. This is not an easy task when specific chemical agents must be evaluated in terms of a specific reproductive toxicity. As in the case of Ms. Laddon,

she was exposed to a series of man-made compounds during early pregnancy. Most of these products contain multiple ingredients including some volative solvents (e.g., petroleum distillate, alcohols, ketones, acetone and xylol).

I would have liked to be very specific with her. I would have liked to have been in a position to tell her that her pregnancy difficulties were either related or not related to her occupational exposure. This was unfortunately impossible since, as far as I know, there is no clear data linking these products to spontaneous abortions in the human. As you are probably aware, only a very minute fraction of the chemicals in our environment have been identified as being harmful to human reproduction. The majority of the chemicals to which we are constantly exposed have not been properly tested or evaluated. Therefore, in the case of Ms. Laddon's miscarriage the compounds to which she was exposed during pregnancy may have played a cause-effect relationship, but we simply do not know.

Mr. SCHEUER. Dr. Spencer, what do you have to say about the degree of specificity that we need on these warnings?

Dr. SPENCER. I am not sure that I can be very helpful on this subject. The industrial hygienist might be more effective in measuring the level of a particular compound and comparing that with the level set by NIOSH regarding acceptable human exposure. One possibility, I suppose, would be for the artist to obtain an inexpensive device that would enable him or her to measure the concentration of any particular vaporized compound, but if one is dealing with several compounds, this becomes impractical.

The problem of labeling of a compound or every ingredient in a particular product is also fraught with difficulties, because many thousands of compounds potentially are within a product is very, very minute levels, and, as such these may not present a hazard. It may be prudent therefore to think about a concentration limit in relation to labeling, and to identify the greatest toxic hazards that may be presented by such a compound. If one puts too many possible hazards on a label, people will never read them.

Mr. SCHEUER. Are all of these chemicals that have these deleterious health effects, do they all have strong odors, or are there some that are odorless and tasteless so that you don't really know?

Dr. SPENCER. Unfortunately, some compounds which do have an odor, nevertheless cause chronic structural effects on the brain after prolonged exposure to levels which are beneath the odor limit.

Mr. SCHEUER. So you can't protect yourself by saying, if you can smell it, you are in trouble?

Dr. SPENCER. Furthermore, I might add that there is a natural process of accommodation to an odor. If you or I walk into a factory with high solvent levels, one's eyes may begin to smart immediately; by contrast, if one observes individuals working with these

compounds, their eyes they may have accommodated to the solvent, and may not even be able to smell in certain instances.

Ms. SEDMAN. May I say something in regard to the lead in stained glass? There isn't any labeling. There is no explanation at all, because in fact you are buying things, or I bought them basically from a distributor. When I went in, I said how many pounds of whatever I wanted. He never asked me if I took any form of precaution to the point of the mask that is over there.

I bought one also, not as good as that, because something told me something was wrong with me. They sold me a mask. They told me how much it cost, they told me to change the two things on the side. It didn't work, and I had the same ventilation problem she did, and I had air-conditioning. I worked right under air-conditioning. Supposedly that would help suck out the fumes. Well, it didn't, and I really feel that if somebody had told me I needed proper ventilation, we would have set the room up right away, because I was that interested in it.

I don't do it any more, and I am well, like you are, but I don't do it any more. I won't touch it.

Mr. SCHEUER. Well, I had no idea when I scheduled these hearings that I was going to be as impressed as I have been this afternoon at the testimony. Congressman Richmond is one of the most effective Members of Congress, and when he came to me and said he had this bill, and would I have a hearing process, I said sure. I did it as a gesture of my personal respect for the Congressman.

But having heard your testimony, I really have a feeling that he really uncovered an area where there is an enormous need for some kind of congressional intervention and some kind of standard setting and information program by the Federal Government.

I can't thank you all enough for your very fine testimony. I had some conflicts. I am overdue on several appointments here, but I can tell you frankly that the real reason that I wanted to get through these hearings and get out is that I have a son who has dropped out of college for a year or two, and he is working as a house painter, and I want to get home and give him the message that he had better get into another line of work.

All right. Thank you again for your very, very stimulating and thoughtful discussion.

We will have the second day of hearings at 2 p.m. tomorrow.

[Whereupon, at 4:22 p.m., the subcommittee was recessed, to reconvene at 2 p.m. of the following day.]

CHRONIC HAZARDS LABELING LEGISLATION

WEDNESDAY, SEPTEMBER 17, 1980

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON CONSUMER PROTECTION AND FINANCE,
COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE,
Washington, D.C.

The subcommittee met, pursuant to notice, at 2 p.m., in room 2322, Rayburn House Office Building, Hon. Thomas A. Luken presiding (Hon. James H. Scheuer, chairman).

Mr. LUKEN. The Subcommittee on Consumer Protection and Finance will come to order.

We are holding hearings on H.R. 6977, the chronic hazards labeling legislation.

Today, we are concluding 2 days of scheduled hearings. During yesterday's hearing, the subcommittee heard extensive testimony on the potential health hazards posed by art supplies to consumers, particularly children. Symptoms described by the artists who testified ranged from headaches, nausea, and skin problems to lead poisoning, leukemia, and miscarriages.

We heard from the physicians of some of the artists that they were unable to diagnose their patient's health problems because of lack of information concerning the composition of art materials which the artist used. Today, we will hear from, among others, several industry representatives to tell their side of the story.

H.R. 6977 was introduced by my colleague from New York. First, it would require that all substances which pose a chronic health hazard be labeled to alert consumers to that threat, and since my colleague is here, we will proceed, then.

We are very gratified and fortunate to have the Congressman from New York, Congressman Fred Richmond.

Mr. Richmond, we will be pleased to hear from you.

STATEMENT OF HON. FREDERICK W. RICHMOND, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF NEW YORK

Mr. RICHMOND. Thank you very much, Mr. Chairman. I want to thank you and your colleagues for this opportunity to testify this afternoon on H.R. 6977, a piece of legislation which I feel could affect the health and well-being of millions of Americans every day.

For the past 2½ years, I have been studying the toxicity of artists' supplies, and was shocked to find that the health and, indeed, the lives of many millions of our fellow Americans are endangered by these products.

But this problem is not new. Almost 300 years ago, an artist complained to his doctor about paralysis in his fingers and hands,

which eventually spread to his arms and feet. Then violent stomach pains began, and the patient did not respond to treatment.

In searching for the cause of the mysterious ailment, the doctor focused on the patient's habit of wetting his paint brush with his tongue and using his fingers to squeeze paint from the brush. The physician was Bernardino Ramazzini, the father of occupational medicine. He theorized that the violent stomach pains were caused by the artist's swallowing cinnabar, a red mercuric sulfide pigment, which we now call vermilion.

Although this puzzling medical case was recorded in the 17th century, a modern day artist might very well suffer from symptoms caused by the supplies that he or she uses, particularly if the artist is not aware of the potential dangers lurking in the chemicals he uses.

In 1975, Louis Harris conducted a study entitled "Americans and The Arts." In that study, Mr. Harris determined that more than 54 million Americans, over the age of 16, are in some way involved with the visual arts. These individuals are not only professional artists, but also hobbyists, teachers, senior citizens, and children. The people involved in creating art—professionals or amateurs—regularly face health-threatening situations when they inadvertently misuse the supplies they employ in their work.

Many products contain harmful chemicals, but the labels on these products do not necessarily inform the consumers on how best to protect themselves against specific hazards.

Worse yet, we find that the art supply manufacturers know about the potential long-term health hazards of their products, but do not put warning labels on these products—sometimes out of fear of losing business. Thus, these artists and hobbyists are becoming ill unnecessarily. Mr. Chairman, let me give you an example of what I mean.

The Ashland Chemical Co., a division of Ashland Oil, in Schiller Park, Ill., is the manufacturer of hexane, a chemical commonly found in spray adhesives and rubber cement. Ashland Chemical puts out a material safety data sheet which states:

> Information suggests that hexane has the potential of causing serious nerve impairment and possibly even nerve damage known as peripheral neuropathy on prolonged or repeated exposure. While Ashland cannot confirm the hazard type or degree of overexposure, due to the seriousness of this potential hazard Ashland recommends avoiding all forms of exposure.

Illinois Bronze, a company based in Lake Zurich, Ill., manufactures a spray adhesive which contains hexane. On its label, which I have here before me, there is no mention of hexane as one of the ingredients. On the back of this label, the only warning that is displayed reads as follows:

> Caution: Use only with adequate ventilation, avoid contact with skin and breathing vapors or spray mist. Inhalation may cause discomfort or illness, get fresh air * * *.

Mr. Chairman, I am sure you would agree that in this particular instance, the art supply manufacturer—not the manufacturer of the chemical ingredient, but the maker of the consumer product used by amateur and professional artists—has been severely delinquent by failing to inform its customers of the potential long-term

hazards associated with its product. Unfortunately, this example is not uncommon.

In front of me today are 30 examples of supplies often used by artists. I bought these materials at art supply stores here in Washington last week. Each one of these products can cause chronic illness or even death if not used properly.

Now, gentlemen, I would like to mention that these are 30 out of literally hundreds of products that are not labeled sufficiently and which we have found can be potentially hazardous if not used correctly. I would like to submit for the record a list of all 30 of these products, showing the product name and manufacturer, the hazardous chemicals within the product, and the health hazards associated with inadvertent misuse. [See p. 107.] At this time, I would like to give you a few examples from that listing.

No. 15 is a lacquer thinner used by silkscreen artists, containing the chemical toluene. It may be absorbed through the skin. It can cause irritation of the nose and throat, narcosis, a possible chronic liver and kidney damage. Inhalation of large amounts may cause heart problems and death. It may also cause menstrual disorders in women. Gloves and goggles should be worn when using this product.

To dispose of the product, the excess should be allowed to evaporate. It should not be poured down the sink.

Then you look at the label, and it says nothing. "For industrial use only. Caution: Inflammable mixture. Do not use near fire or flame." It doesn't say a word about the fact that it can cause all of these diseases and should be handled with great care.

I will take another one here. Product No. 10 is a tube of cadmium vermilion oil paint. It contains cadmium mercuric sulfide. This can cause mercury poisoning which affects the nervous system as a result of accidental ingestion. Ingestion can be avoided by not eating, drinking, or smoking in the workplace, and by not wetting brushes with the lips. Hands should be washed carefully with soap and water or a safe waterless hand cleaner, not a solvent.

The first sign of symptoms of mercury poisoning may include muscular tremors, irritability, and psychological changes, depression, loss of memory, frequent anger, and indecision.

Now look at the product. There is no warning whatsoever on the product. Nothing. It just says "Cadmium vermilion, red, light."

I will just take your time with one more example, if I may. No. 4 is a bottle of rubber cement used by a variety of consumers: artists, hobbyists, students, and office workers; it can cause permanent nerve damage. It should be used with an exhaust ventilation system or an organic vapor respirator. At the first sign of loss of sensation in the feet or hands, a physician should be informed of hexane and its exposure.

Yet you look at the label, and all it says is "Extremely inflammable."

My bill, H.R. 6977, which you are considering today, is one solution to ending these and other health risks faced by America's 54 million artists.

This bill mandates that each product containing potentially harmful chemicals has a label clearly stating five very important pieces of information:

One, the common name of each chemical found in the product; two, the potential hazards associated with misuse of these chemicals; three, how to avoid these health hazards; four, the antidotes to the health hazards; and five, how to dispose of the product safely.

While I have suggested this to various manufacturers and received a great deal of resistance, not all art supply manufacturers are resistant to this type of consumer sensitive labeling. Richard Platt, president of Polyproducts Corp. in Michigan, has already decided to redesign the labels on his artists' supplies so as to conform to the provisions of H.R. 6977.

I do not want to remove any product from the marketplace. But I do want to inform the consumer of the potential hazards he or she faces when using a certain product.

That is all this bill asks: Let the individual have enough information to make a reasonable choice, both in using the product and in deciding upon the precautions he or she should take to avoid specific health hazards.

In closing, I would like to submit additional written testimony for the record. This testimony comes from artists throughout the Nation who would have appeared before you if time permitted. After reading these statements and listening to the witnesses who will appear, I am certain that you will agree that severe, long-term health hazards exist because the labels of certain art materials are not sufficiently informative. [See p. 109.]

Following these hearings, I trust you will move swiftly to approve H.R. 6977, thus hastening the day when we will see an end to the threat of unnecessary chronic illness afflicting millions of American artists.

Thank you.

[Testimony resumes on p. 140.]

[Attachment to Mr. Richmond's prepared statement and additional material refered to follow:]

NAME OF PRODUCT	CHEMICAL	MANUFACTURER	HAZARD
Scotch Photo - Mount	Hexane	3M	Peripheral Neuropathy
Turpentine	Gum spirits of turpentine	Grumbacher	Kidney damage, skin and respiratory allergies.
Thinner for Rubber Cement	Hexane	Sanford Corp.	Nerve damage
Rubber Cement	Hexane	Sanford Crop.	Nerve damage
Cold Water Fabric Dye Batikit	Hexane	AMACO	Severe respiratory allergies
Cadmium Yellow Oil Paint	Cadmium	Grumbacher	Kidney damage, possibly lung and prostate cancer.
Manganese Blue Oil Paint	Manganese	Winsor & Newton	Manganese poisoning - similar to Parkinson's Disease.
Phthalo Green Oil Paint	PCB contamination	Speedball	Birth defects, cancer, chloracne
Flake White Oil Paint	Lead Carbonate	Grumbacher	Lead poisoning, kidney damage
Cadmium-Vermillion Red Light Oil Paint	Cadmium Mercuric Sulfides	Permanent Pigments	Mercury poisoning
Celluclay Instant Paper Mache'	Possibly Lead	Activa Products, Inc.	Lead poisoning
Flo-Paque Color	Xylene	Floquil-Polly S	Liver damage, menstrual irregularities
Powdered Rosin	Rosin	Graphic Chemical & Ink Company	May cause asthma
Clear-Casting Polyester Resin	Styrene	Industrial Plastic	Liver damage, lung irritation narcosis
Easy-Flo Silver Solder	Cadmium	Handy & Haromon	Kidney damage, possibly cancer and death.

NAME OF PRODUCT	CHEMICAL	MANUFACTURER	HAZARD
Acrylic Cement Quick-Drying	Methylene Chloride	Flex-Craft Industries	Skin irritation, heart attacks.
Self-Flexing Acid-Core Solder	Lead	Lenk	Chronic Bronchitis, burns
Flo-Master Opaque Ink	Aromatic Hydrocarbons, Naphthas	Faber-Castell	Liver damage
Chrome Yellow Ceramic Glaze	Lead Chromate	Ceramichrome	Chronic lead poisoning
Stained Glass Kit	Lead	Ernani Art Studio	Lead poisoning
Red Lead	Silica	Stewart Clay, Co.	Silicosis
Rit Dye	Benzidine-Type Dye	Best Foods	Bladder Cancer
Star-Sheen Supreme One-Coast High Gloss Finish	Diisocyanates	American Handicrafts Tandy	Chronic asthma at low levels of exposure
Royal-Coat Craft Accessories	Lead	Cunningham Art Products, Inc.	Lead poisoning
Parting Powder	Probably Talc & Asbestos	All-Craft Co.	Asbestosis, Mesotheiloma, lung and other cancer
Leather Dye	O-Dichlorobenzene	Caldwell Crafts	Liver and kidney damage
Jordan Clay	Silica	Baldwin Pottery Store	Silicosis
Strontium Oil Paints	Strontium	LeFranc Bourgeouis (import)	Strontiumpoisoning
Liquid Glaze For Oven-Firing	Unknown solvent, no contents label	Sculpture House	Unknown hazards

AUG - 6 1980

Boston University Medical Center

School of Medicine
80 East Concord Street
Boston, Massachusetts 02118

Department of Neurology
Office of the Chairman
(617) 247-5136

August 13, 1980

Congressman Fred Richmond
House of Representatives
Washington, DC

Dear Congressman:

Upon request of your office through Mr. Barry Nicholsberg, I shall attend the hearing on September 16. Enclosed you will find a copy of a chapter concerning lead poisoning in hobbists.

Please give me specific instructions and backround on the hearings so that I might be best prepared. I shall confirm the details of this during my visit to Washington later this week.

Sincerely yours,

Robert G. Feldman, M.D.

Robert G. Feldman, M.D.
Professor and Chairman
Department of Neurology

LEAD INTOXICATION AMONG HOBBYISTS

ROBERT G. FELDMAN, M.D.

Professor of Neurology and Pharmacology;
Chairman, Department of Neurology, Boston University School of Medicine ;
Chief of Neurology, Boston Veterans Administration Medical Center;
Lecturer in Occupational Medicine (Neurology) Harvard School of Public Health

Presented at First National Conference on Health Hazards in the Arts and Crafts. Sponsered by the Society for Occupational and Enviornment Health, Washington, D.C., October 19, 1978

The exposure of artists and craftspersons to occupational hazards is not a new problem. It has been suggested (1) that Fransisco Goya may had had symptoms of lead intoxication caused by the high concentration of lead in the white paint he used in large amounts to achieve the luminous mother-of-pearl tones of his canvasses. Like other artists of the period, Goya ground his own pigments and applied them with rags, sponges, and his bare hands. There are many crafts and hobbies in which there exists risk of lead poisoning. Working with milten lead to make toy soldiers, pellets or bullets; hand gun shooting in an enclosed firing range; soldering metal sculptures, pottery glazing; jewelry making; and lead glass artistry are all hobbies with the potential for causing undue exposure to lead in various forms.

Lead enters the body through the mouth, nose, and oral pharynx. Dust containing lead particles, fumes of lead oxide and other gaseious compounds, or solutions contaminated by lead eventually are absorbed into the blood stream. This occurs after a net absorption by the gastrointestinal tract in humans of about fifteen percent or less; the remaining lead is excreted in the feces. The contribution of airborne lead to body lead content is dependent on multiple factors including the size and distribution of the inhaled particles. Most atmospheric lead consists of articulate lead compounds which vary in size over a range of 0.16 to 0.43 micra. It has been estimated that nearly 90 percent of lead particles in the ambient air are deposited in lungs and are small enough to be retained. Assuming 37 percent deposition of lead containing particles

from ambient air and 24 hour volume of inhaled air to be 15 cubic meters, airborne lead only contributes 15 micrograms per day at an atmospheric concentration of lead of three micrograms per square meter. There is evidence, however, that higher concentrations of airborne or atmospheric lead may influence blood lead levels. Such is the case in enclosed areas where workers might not realize the concentration increasing over time with increasing temperature.

Lead is contained in blood in two forms. More than ninety percent is bound to red blood cells and is non-diffusable; the remainder is bound to microligands in the plasma. Since the major fraction of whole blood is bound to red cells, hematocrit or packed red blood cell volume will greatly influence a total blood lead content. Lead content of an individual organ is likely to increase and to show the rapid accumulation in tissues most sensitive to the toxic effects of leadn, particularly the central nervous system (2). Lead has a strong affinity for mitochondria and mitochondrial membranes. Lead binding sites on mitochondria are presumed to be the reactive groups on amino acids for which metal binding has been demonstrated. Binding of lead to mitochondrial membrane as occurs in lead intoxication results in ultra-structural alterations.

The nervous system is particularly sensitive to the toxic effect of lead. Symptomatology varies from ataxia to stupor, coma and convulsions in the acutely intoxicated individual. In spite of the seriousness of clinical effects of lead on the central nervous system less is known about the lead induced lesions of the nervous system than about those affecting the renal or hemapoietic systems.

The most prominent pathological changes noted inthe brain are cerebral edema associated with increase in cerebral spinal fluid pressure, proliferation and swelling of endothelial cells accompanied by dilatation of capillaries and arterioles, proliferation of glial cells and focal necrosis and neuronal degeneration. Lead-induced peripheral neuropathy is manifested by motor weakness and is usually the result of chronic exposure. The lesion in the peripheral nervous system is one of segmental degeneration of myelin sheaths. The incidence in nature of sequelae of lead intoxication are related to the mode of onset of symptoms, i.e. acute or chronic. It has been suggested that subtle neurological effects of lead might occur in the course of chronic exposure to lead without accompanying signs and symptoms of overt lead poisoning. There are studies which indicate some correlation between duration of exposure to lead and severity of conduction defect in the peripheral exposure to lead and severity of conduction defect in the peripheral nervous system (3). Apart from functional neurologic sequelae, it has been questioned as to what degree lead affects mental development in lead poisoned children or may present as a dementing syndrome in adults. Anemia is an early manifestation of acute of chronic lead intoxication and its most early diagnostic finding is an elevation in the free erythrocyte protoporphyrin levels. The occurrence of a chronic form of renal disease in man has been considered another possible toxic effect of lead.

There are many factors which contribut to the susceptibility to lead intoxication. These include age, seasonal variation, calcium, and phosphorous levels, protein in the diet, vitamin deficiency,

presence of alcohol, iron deficiency, and presence of co-existing disease. Blood levels are a useful measure of lead intoxication since lead concentration in the blood is in equilibrium with soft tissue content of lead which in turn is related to adverse functional or metabolic effects. Increase in urinary excretion of delta-amino levulinic acid and coproporphyrinuria reflects early effects of lead on heme synthesis. The most sensitive biological assay of blood lead levels presently available is the decreasing activity of the enzyme amino lubulnic acid-dehydrogenase in hemolyzates of whole blood with increasing blood lead levels.

Although concern for potential toxic effects of lead has risen from growing awareness of the relatively large amounts of lead in the environment, there is uncertainty, however, regarding the potential harmful effects of low levels of lead that do not produce overt toxicity. It is this low level of exposure which may go unrecognized in the hobbyist. In most instances, the ingredients of substances used by hobbyists are know, but in may others the potential risks of the substances are not appreciated. Word of mouth, person-to person instruction may point out hazards and encourage safety measures to be used with particular techniques. It is the unknowing beginner depending upon instructions given with the do-it-yourself kit, who may not realize the seriousness of the risk.

Lead Glassmaking

A thirty-six-year-old woman presented with a history of nausea, abdominal cramps, malaise, headache, irritability, and numbness, tingling and weakness of the hands fluctuating in severity

but increasing over about one year's duration. Her physician sought an explanation for her by performing an upper gastro-intestinal study and a gall bladder test. He recognized that she was slightly anemic (hematocrit, 36%) and treated her for this condition. Because of a change in her personality she was referred to a psychiatrist for depression. The psychiatrist recognized within her story her hobby, lead glassmaking. Further studies were obtained which confirmed a diagnosis of increased body burden of lead. The whole blood lead levelwas 58 mcg/100 grams (normal, less than 40 mcg/100 grams) and a free erythrocyte protoporfin concentration of 300 mcg/100 ml. Neurological examination showed minor depression in her ankle jerk reflexes but nerve conduction velocity studies of the peroneal motor nerves confirmed peripheral neuropathy. Motor nerve conduction velocity of the right peroneal nerve was 41 meters per second.

On the basis of elevated blood lead and FEP concentrations as well as slowed conduction velocity, Edetate Calcium disodium (25 mg./k g) was given. A base line 24 hour urine excretion of 20 mg/l was followed by a post chelation urinary output of 2100 mg/l. One year later and after improving ventilation in her lead glass studio she has had no symptoms and her blood lead level was 32 mcg/100 g. Her conduction velocity had increased to 50 meters per second.

The art of making leaded glass windows and jewelry is being persued by an increasing number of hobbyists, many of whom are unaware of the dangers of handling lead strips and soldering seams. They do not recognize the need for proper precautions and safety measures. The patient described had not realized this need as her

work room was not properly ventilated. References she had read to explain the technique did not inform her of the hazards.

Of the various books that have been written on the subject, (5)(6)(7) most attribute the rare case of intoxication to "poor hygiene" and suggest that there is little hazard. Isenberg (7) stated, "We have seen individuals working with lead while reading instructions, who while turning pages would wet their fingers unconsciously with their tongue . . . as far as the dangers of lead fumes liberated during soldering process . . . such fumes are negligable."

Lead particles and lead oxide stick in the pores of the skin. They are not absorbed into the body unless ingested. Anyone handline lead for long periods of time will find on his fingers a deposit of lead oxide. If he is in a rush and decides to eat a sandwich with his hands still dirty or if he has a habit of licking his fingers a certain amount of lead will be absorbed. In reference to ornaments made of lead glass hanging in children's rooms, the statement "be careful, it can be harmful if the lead is eaten" was found in one set of instructions (5) Armitage (4) cautioned about possible means of exposure to lead while creating stained glass ornaments during the process of making glass from silica, soda and lime, potash, lead oxide (used as a flux), coloring agents, and decloring agents. The lead glasses are made by melting lead oxide or lead silicate with alkalines, silica and minor ingredients. Lead oxide content of higher than 92% has been found in some glass. Designs and features may be painted on the glass and fired

in. The pain is an oxide of lead, usually black, dark brown or dark red (8).

It is the lead came (pronounced cāme or calm), the channeled strips of lead used to bind together sections of stained glass (5) which is pure without additions. Certain cames may be tougher than others. Soldering is the technique of joining the pieces of came together under heat. The solder which is recommended contains 40% lead, 60% tin, (5).

Of the various references, the statement by Isenberg (7) is most direct. These authors state that lead poisoning is one of the first topics inquired into by beginners in stained glass. Howeverm the state "personally, we ourselves know of no one, beginner or professional, working in the stained glass art who has ever suffered any difficulty with lead no matter how slight. We do feel, however, that one cannot error on the side of caution, while we certainly do not advise anyone to wear gloves, we feel that the skin of the hands should be thoroughly cleansed before leaving the workshop." (7). These statements are hardly strong and emphatic safeguards considering the seriousness of hazards to the nervous system.

Lead Glazed Pottery

Edwin Atlee Barber was the curator of the Pennsylvania in 1907 (9) when he descrived the values of lead glazed pottery. He wrote, "Lead applied to pottery as a coating to render it impervious to liquids, was used in Europe as early as the 12th century. There is reason to believe that lead glazed pottery was made in Italy from the

8th to the 15th century, at which period stanniferous enamel began to take its place as a covering for pottery which was to be decorated by the application of colors, but the more ordinary varieties of earthenware continued to be glazed with lead through the following centuries down to the present day." Unfortunately, by 1970 earthenware containers as a source of fatal lead poisoning continued to present themselves and isolated cases of lead poisoning among potters appears almost routinely in surveys of the occupational hazards among hobbyists. Often earthenware is made by private craftspeople and are picked up by tourists and brought home. However, a detailed study by Klein et. al. (10) revealed that 50% of all glazed surface tested were unsafe for table use containing more than seven parts per million of lead. Twenty-five percent of all domestic hand-craft and ten percent of imported and commercial earthenware released over 100 parts per million of lead. Lead release in the range of 100 parts per million would be expected to result in severe acute poisoning in small children under the conditions of using them for acidic solutions such as juices. Continuous use of containers releasing lead in the range of 7-20 parts per million would give rise to chronic lead poisoning. In this event the symptoms are insidious and diagnosis is difficult because of the similarity to common functional complaints. Hughes et. al. (11) described a 48-year-old woman who complained of persistent nausea , vomiting and abdominal discomfort. She was found to be anemic with marked basophil stippling oberserved in the red blood cells, suggestive of lead poisoning. This was confirmed by an elevated blood lead level of 6.4 umol/l (normal, up to 2 umol/l).

Symptoms subsided after successful treatment with BAL and EDTA. The patient was admitted to the hospital on two occasions because of recurrence of symptoms. The source of the lead poisoning was finally discovered to be two ornamental jugs which she used in order to store fruit juice and milk. The fruit juice generally remained in the jug several days before being completely consumed. The jugs were tested for extractability of lead and they were determined to release 47 mg. lead/l and 39 mg. lead/l. The maximum permitted safe limit is 2 mg. lead/l, demonstrating that they were, indeed, the source of lead poisoning.

Public demand for hand made pottery leads to increased production and availability of the articles. The solubility of lead glazes on earthenware designed for household use has long been a matter of importance and in some countries it is regulated by legislation (12). Ceramic glaze is a thin layer of glass fused onto the surface of claywares. The basic glass former in ceramic glazes is silica, and element that combines freely with other oxides to form a variety of complex silicates. Lead is a common constituent of earthenware glazes. In the past, lead has often been used as a sole glass former or glaze of low-fired wares. Despite the toxicity of lead compounds, they are invaluable to the potter, for they impart characteristics to the glaze unequaled by other oxides. Lead bearing glazes properly compounded to yield low lead release may be profoundly affected by the addition of various oxides. Introduction for color and texture, these oxides may sufficiently alter the final fired glazed composition and render it soluble. Because of the toxic nature of lead, all pottery

designed for table use must have a glaze that does not dissolve at all. Absorption and inhalation of lead compounds used in work shops present an additional hazard. Lead can be converted into compounds that are non-toxic to the workers handling them by a process called fritting.

A frit is a glassy material made by fusion of various glaze components. A frit is designed for use as a constituent of glaze, although entire glazes may be fritted. There is a common misconception that commercial frits are "safe" and that they are often used to complete glaze. Frit compositions vary extensively and many lead bearing frits are highly soluble. For example, the glaze on the earthenware jug referred to in the case reports of Klein et. al. of two children who were poisoned, was a lead bearing frit. This frit is highly soluble and difficult to use safely even as a minor glaze constituent. The craftsman had repeatedly used this frit as the glaze, believing all frits were "safe" and purchasing it by catalog number for a well known north American chemical company.

While the two children reported in that article were seen medically because of severe brain edema and acute lead intoxication, one would raise the question as to what toxic effects the craftsman himself might have experienced. Occupation related disease in a community of potters in Barbados were studied Koplan et. al. (13). These authors reviewed the heal hazards of the potters using lead glazes. Chalky Mount is a community in the rural county of St. Andrew in Barbados, West Indies. This village has seven potteries. The rooms were the pottery is made join the family living quarters. Rooms are at most 5 x 5 meters in size and are ventilated by open windows. The principle technique used in Chalky Mount pottery

involves allowing the molded clay to air dry, coating the object with molasses and then applying a metal glaze. The brown red lead glaze is made by heating discarded lead pipes in the fire in the pottery and then pulverizing the oxidized product with a mallet. The lead oxide powder is thrown by hand onto the molasses covered object and then baked in a kiln. The glazing pocess produces clouds of lead oxide dust.

From the interviews of the survey participants in Barbados, fifteen people stated that they had symptoms that were consistent with lead intoxication: nausea, vomiting, diarrhea, constipation abdominal pain, malaise, weakness, irritability, headache, forgetfulness." The survey demonstrated that the greater the exposure to lead dust or lead glazed pottery the higher the blood lead levels. The trend was consistent throughout all sub-groups of the population survey. Dust from the potters' homes and work areas contain lead in concentrations up to 320,000 parts per million. Potter was found to have lead release levels up to 3,125 mcg/ml. The blood leads were not elevated because of the stabilization of these levels in equilibriu, with other tissue on the basis of chronic exposure.

The study from Barbados is an extreme example of toxic exposure by individuals who were unaware of potential risk. In our modern society with many housewives and young persons seeking avocation in the pottery field it is important for us to be concerned about information available to them concerning these risk.

Conclusion

Lead has acute and chronic effects on the human body, affecting blood making and nervous system functioning. The hazards vary with

the duration and intensity of exposure--the dose. Absorption is by way of inhaled or ingested dust containing lead particles or gaseous forms of lead, oxides, or sulfides. While the beauty and permanence of an art object is the goal of the craftsman, his own safety must not be neglected. The lead content in a lead silicate glass formula adds greatly to the unique coloring of the glass. The lead came sets the glass pieces apart for individuality. The high shine of a lead glaze on pottery adds distinction. Both can be achieved if the worker recognizes the potential hazards, and the consumer know the limitations of use. Specifically, don't give a child a lead glass ornament, don't eat or drink from a lead glazed mug.

REFERENCES

1. Niederland, W.G.: Goya Lead Poisoning Theory. M.D. Newsmagazine 16:90, 1972.

2. Goyer, R.A.; Rhyne, B.C.: Pathological effects of lead. Int. Rev. Exp. Pathol 12:1-73, 1973.

3. Feldman, R.G.; Hayes, M.K.; Younes, R.; Aldrich, F.G.: Lead neuropathy in adults and children. Arch. Neurol. 34:481-488, 1977.

4. Armitage, E.L.: Stained Glass. Charles T. Brenford Company, Newton, Massachusetts, 1959.

5. Hamilton, W.J.: The Technique of Making Leaded Glass Ornaments. Hamilton Studio, Silver Spring, Maryland, 1971.

6. Rothenberg, P.: Creative Stained Glass. Technique for Unfired and Fired Projects. Crown Publishers, Inc., New York, 1973.

7. Isenberg, A.; Isenberg, S.: How to Work in Stained Glass. Chilton Book Company, Philadelphia, 1972.

8. Judson, W.W.: Stained Glass: A Step-by-Step Guide. Galahad Books, New York, 1972.

9. Barber, E.A.: Lead Glazed Pottery. Doubleday, Page and Company, New York, 1907.

10. Klien, M.; Namer, R.; Harpur, E.; Corbin, R.: Earthenware containers as a source of fatal lead poisoning. New England J. Med 283:669-672, 1970.

11. Hughes, J.T.; Horan, J.J.; Powles, C.P.: Lead poisoning caused by glazed pottery: case report. N.Z. Med. J. 84:266-8, 1976.

12. Pottery (Health) Special Regulations October 7, 1947, Minister of Labor and National Service under Section 60 of the Factory Act 1937, Great Britain and the Pottery (Health and Welfare) Special Regulations 1950. January 16, 1950, SL 1950, No.65, Great Britain.

13. Koplan, J.P.; Wells, A.V.; Diggory, H.J.P.; Baker, E.L., Liddle, J.: Lead absorption in a community of potters in Barbados. Int. J. Epidemiol. 6:225-229, 1977.

August 25, 1980

To: The Honorable Gentlemen of the House Ways and Means Committee

Subject: H.R. 6977

Gentlemen, I respectfully submit the following testimony.

My name is Aileen Lubin, I am 54 years old, having left a business career recently to pursue the profession of fiber artist. I am employed by my daughter Nancy, owner of Western Maine Weavers, No. New Portland, Maine, a business utilizing the talents of other weavers as well as our own.

When I took DES in 1950 as prescribed by a physician, no one told me of the potential risk of cancer to my unborn daughter. Indeed, it can be argued that no one at that time knew of the risk. When, in 1953, I suffered third degree burns over 20% of my body in an accident caused by undetermined ignition of an alcohol-based contact cement, commonly available for household repairs, no one told me I was using a highly volatile and dangerous product.

But now in the 1980's we know a great deal more about chemicals, their toxicity to human beings and problems caused by environmental health hazards in the work place. I also believe the consumer's right to information in the market place is not a debatable issue. President Kennedy established this fact in his Declaration of the Consumers Bill of Rights.

In our work, my daughter and I use several textile dyes about which we know very little other than they are toxic. Some manufacturers will supply ingredient content, others will not. Some purchases are made direct from manufacturers, others come from middlemen from whom no information is available.

Because of my stated previous experience with pharmaceuticals and household chemicals, I perhaps was more prone to act upon the introduction of this bill. I feel strongly that this bill could prevent untold suffering and loss of life to a vital and growing segment of our economic life, the American artist. You have those figures before you. I will not repeat them here. My concerns are for the health of myself, my daughter and her unborn children, as well as our fellow artists and craftsmen.

The food industry did not suffer from content and nutritional labeling, indeed they turned it to marketing advantage. I submit the same could be true of the artists' materials industry. However, since they have not chosen this route voluntarily, I ask you, members of Congress, for the protection and safety of my health and that of my fellow artists. I urge your favorable report of H.R. 6977.

Respectfully submitted.

Aileen Lubin
6402 Middleburg Lane
Bethesda, Maryland 20034

Julian A. Waller, M.D.
125 Holmes Rd. Ext.
South Burlington, VT 05401

September 8, 1980

Congressman Fred Richmond
1707 Longworth Building
Washington, DC 20515

Dear Congressman Richmond:

I am writing in support of your legislative proposal to require labelling of art materials so that consumers can be informed about the hazards involved. I am familiar with the health hazards because of my training as a physician and epidemiologist. I am a Board certified specialist in Public Health, former member of the Bureau of Occupational Health of the California Department of Public Health and for several years was actively involved in improving the often limited abilities of Poison Information Centers to respond to urgent questions from physicians and the public. My involvement in research in product safety spans a period of almost 20 years.

For the past 13 years I have been at the University of Vermont, now as Professor of Medicine, and previously as Professor and Chairman of the Department of Epidemiology and Environmental Health. My wife is a professional fiber artist, I myself am active as a potter, and most of our friends are professional artists or crafts people.

Four years ago, in response to my observations of health problems related to work as artists among several of our friends, and to the anxiety, lack of knowledge, and lack of ability to get information that artists have about the health issues of their work and materials, a colleague (Dr. Lawrence Whitehead) and I began planning two workshops on health hazards in the arts. Because these workshops received little publicity outside Vermont, we were surprised that they attracted 200 attendees from six states.

Since then we have given several other regional or national workshops and have written almost 20 articles for American Craft (formerly Craft Horizons) and other craft publications in order to provide some of the information that the artists are so desparately requesting. It has been an exceedingly frustrating task. Even as a health professional specializing in environmental issues and with nationwide and international contacts, I find it time consuming and sometimes difficult to track down information which a manufacturer - both for worker safety and for liability purposes - should already have about his product.

70-237 O - 81 - 9

My observations about the history and current status of health hazards in the arts with respect to your proposed legislation are as follows:

1. That work with art materials can be hazardous to one's health was documented by Bernardino Ramazzini, the father of Occupational Medicine, as long ago as 1700!! Nonetheless, as recently as only three weeks ago I attended a ceramics class as a student at Haystack Mountain School of Crafts where we purchased and used commercial glazes comprising some of these same materials. It was impossible to identify from the labels not only what the hazards of these materials are, but even which of several heavy metals were actually present in the glazes.

2. The hazards are not just theoretical. A survey of artists we carried out in conjunction with our 1977 workshops revealed that about a quarter of the respondents had experienced health problems within the previous 12 months that appeared to be related to their work. Since then I have been contacted with increasing frequency, now approaching once every two or three weeks, by artists or physicians regarding health problems which are probably or proven to be related to hazardous materials. The physicians have been as frustrated as their patients by the inability to obtain information about products in use and their effects. My previous experience with Poison Information Centers convinces me that these facilities are more likely than not to have inadequate information about the products under discussion. Furthermore, every one of the "Hotline" calls I have made to CPSC has ended up in what I could document as inaccurate or incomplete information.

3. While many products are hazardous after either short or prolonged exposure, many are not. I have been as frustrated by the amount of time and effort it has often taken me to find out that something is not toxic or allergenic as to find that it is potentially a problem. The public and the professionals need easy access to the good news as well as the bad.

4. This problem of limited information would not be so serious if the distributors and retailers had the information available and could inform the public. Unfortunately, they too lack the knowledge, are frustrated by their own exposures and liability and frequently don't even know that product safety data sheets exist and can be requested. Often a retailer receives material that has been repackaged by the distributor with virtually no information present. My wife, as a weaver, has a whole shelf of dyes and mordants she has ordered in one or two pound quantities and that have arrived in paper or plastic bags, in some cases with no label at all, and in other cases with only a name of the material and no information even about who sold it. If she forgets to add that information when she receives the order she is unlikely to know who to contact for further information when she first attempts to use the materials several months later. She has thrown some of them away rather than use them in risky fashion.

As one of the members of the National Academy of Sciences review panel for National Bureau of Standard's Consumer Product Technology Center, I am quite familiar not only with the need for labelling, but also with some of the problems for industry and regulators potentially associated with the design and implementation of a labelling law. Furthermore, part of my training and much of my work has been concerned with health education concepts, methods and limitations. My support of your proposal is not an outgrowth of altruistic feeling that it would be "nice" to have labelling but because I think that the medical need for such legislation is clear and that the methods for implementation are feasible within what we already know through experience about both the technology and limitations of such health

education approaches. My specific comments regarding feasibility are as follows:

1. Industry commonly argues that labelling may be of interest and benefit to only a minority of the consumer population. This appears not to be the case with art materials however because, unlike the general public, users of these materials are process oriented. If they wanted something already complete they would not chose this particular type of work or avocation. Artists want to know what they are dealing with, and what it can or can't do to their work and to them when applied in a variety of ways.

2. Manufacturers or distributors who sell to retailers should routinely be required to send complete product data safety sheets to the retailer with each wholesale order. Thus, each and every retailer can always have up to date information about what is being sold. Since the number of retailers compared to the number of ultimate consumers is relatively small, the economic impact on the manufacturer will not be great.

3. Ideally, all materials should have package inserts, a requirement that has been successfully applied for drugs. Since this is a more costly approach to informing the public, however, other possible approaches are to require one of the following: a) all materials should be labelled to inform the ultimate consumer that a safety data sheet exists and where and how it can be obtained, or b) all products that contain materials with at least moderate long or short term toxicity(e.g. a toxicity rating of 3 or greater on a scale of 6 for acute toxicity)* should have a package insert , or c) all products containing materials with moderate toxicity or greater should so state on the label and should inform the consumer how to get a safety data sheet. But, however you approach it, a labelling law for art materials is long overdue.

Sincerely,

Julian A. Waller, M.D.

Julian A. Waller, M.D., M.P.H.

JAW/wmc

*From Gosselin et al, Clinical Toxicology of Commercial Products, 4th Edition, Williams & Wilkins Co., 1976. (See attached table)

the introduction to Section II, toxicity ratings are estimates of lethality and reflect the approximate amount of any "poison" that must be ingested per kilogram of body weight to kill a typical victim. The exact but arbitrary limits that define each numerical toxicity class are specified in Table VI-1. The techniques outlined below were used to select the ratings in Section VI, as well as all unpublished ratings in our files. See also: R. E. Gosselin, Journal of the American Medical Association, *163*: 1333, 1957.

Two ways are available for assessing the toxicity of commercial mixtures (when the most meaningful data—the effects of known doses in the human—are unknown). First, the product itself can be given to laboratory animals to estimate (a) the lethal dose, (b) the nature of the toxic syndrome, and (c) the target organ sustaining damage if any. Many alert manufacturers secure these data about their own merchandise, and increasing numbers furnish this information to us. Second, most toxicity ratings in our files, however, are based on another method of estimation, which requires a toxicological appraisal of each ingredient in the commercial mixture. Ideally the identity of every constituent and the complete composition should be known; in practice, full information is seldom available and seldom essential. Whenever Section II contains information about the lethality of single ingredients when tested separately, the probable lethal dose of a commercial product can be inferred if one is willing to assume that all constituents act independently and have neither additive nor antagonistic effects. Except when two or more ingredients are chemically related, this simplifying assumption is believed to be permissible in most cases, because the final estimates are not intended to be precise. Another way of stating our working hypothesis is this: **the presumptive lethal dose of a commercial mixture may be gauged as the smallest quantity which contains a fatal amount of any one of its constituents.** By this operational definition, the toxicity of a mixture is determined solely by one of its ingredients (or one group of chemically related ingredients), all others being regarded as diluents. This critical ingredient is designated in Sections V and VI by an asterisk, but only if the ingredient is present in sufficient concentration to give the product an overall toxicity rating of 3 or more.

To illustrate these remarks, hypothetical examples are useful. Because of inadequate data, the acute toxicity of propylene dichloride cannot be specified precisely—but the lethal dose is generally believed to lie somewhere within range of 50 to 500 mg./kg., i.e., within the toxicity class 4. Any product containing propylene dichloride as the only significant toxic ingredient would be assigned (a) a toxicity rating of 4 if the concentration of propylene dichloride were greater than 10%, (b) a rating of 3 if the concentration lay between 1 and 10%, and (c) a toxicity rating of 2 if the concentration lay between 0.1 and 1%. In other words, a factor of 10 is used in going from one toxicity rating to another. Obviously these limits are arbitrary, but a convention of this kind is an operational necessity in most cases. Where the acute toxicity lies near the border of toxicity ranges 3 and 4, which is the case for xylene, the toxicity rating of 4 would be given if the concentration of xylene were 20% or more, a rating of 3 for concentrations between 2 and 20%, or a rating of 2 for concentrations between 0.2 and 2%. Boundary values are unnecessary whenever the lethal dose of the only starred ingredient is comparatively well established (*e.g.*, 0.3 to 0.4 gm./kg. for aspirin). As another example, a product composed half of benzene and half of carbon tetrachloride would be assigned a rating of 4, and both components would receive an asterisk. A product made half of benzene and half of kerosene would also be rated 4, but only the benzene would be starred, since the rating of

TABLE VI-1

Toxicity Rating or Class		Probable Oral LETHAL Dose (Human)		
		Dose		For 70 kg. person (150 lb.)
6	Super toxic	less than 5	mg./kg.	A taste (less than 7 drops)
*5	Extremely toxic	5-50	mg./kg.	Between 7 drops and 1 teaspoonful
4	Very toxic	50-500	mg./kg.	Between 1 tsp. and 1 ounce
3	Moderately toxic	0.5-5	gm./kg.	Between 1 oz. and 1 pint (or 1 lb.)
2	Slightly toxic	5-15	gm./kg.	Between 1 pt. and 1 quart
1	Practically nontoxic	above 15	gm./kg.	More than 1 quart (2.2 lb.)

TESTIMONY OF ASSEMBLYMAN JOSE E. SERRANO

ON H.R. ~~6097~~ 6977.

Good morning (afternoon/evening) ladies and gentlemen, I am pleased to be able to speak to you today concerning an issue which is important to all of us gathered here today--the labeling of artist supplies which contain toxic substances. As Chairman of the New York State Assembly Standing Committee on Consumer Affairs & Protection, I have declared that legislation requiring labels to appear on all toxic substances be a Committee priority in our own State.

According to the most recent survey conducted by the National Endowment for the Arts, the number of working artists in the United States increased a full 50% in about half a decade--from 600,000 in 1970 to 900,000 in 1976. Painters and sculptures totaled over 107,000 while photographers numbered close to 66,000. Moreover, a 1975 Harris poll revealed that 39 percent of individuals over the age of 16 (56.7 million people) are engaged in woodworking, weaving, ceramics and other crafts, and that over 16 percent (21.8 million people) are engaged in painting, drawing or sculpting.

I believe that it is the government's responsibility to insure that the millions of individuals involved in the arts are at least aware of the hazards that may confront them. The government must thoroughly examine the reports released by artist protection and occupational safety groups which cite the existence of hazardous substances in many art supplies. For example, silica has been found to cause irreversible lung damage and this substance is found

in many clays. Glazes contain such known or suspected carcinogens as nickel, cadmium and uranium oxide. Lead is present in many pigments and in solders used in making stained glass.

It is my belief that both artists and hobbyists involved in art work are unaware of the substances found in artist supplies and the possible hazards associated with them.

Responses to a survey conducted by my staff, which requested information on the precautions taken by art schools and day care centers during art classes, illustrate the lack of awareness among people in the arts.

One art school confided to us that turpentine fumes had caused distress among its students. In order to help alleviate the problem all the classroom doors were opened--a move which the respondent claimed rid the room of excess fumes.

Finding it difficult to believe that this move was sufficiently safe, I commissioned my staff to investigate the matter. After reviewing several texts and conversing with the Art Hazards Project in New York, we found that although turpentine fumes are generally less dangerous than those fumes emitted by solvents such as benzene, xylene, or toluene, the aforementioned situation still requires a separate exhaust system. My staff relayed this information to the art school.

Furthermore, a day care center in Albany, New York insisted that their instructors are aware of inherent dangers in the products used, despite the fact that these same teachers had been exposed to little information on the dangers of art products. This example describes the prevailing lack of awareness among institutions of the dangers inherent in some art products.

In order to obtain first hand information on the awareness of individual artists to the possible dangers of art supplies, my staff undertook two separate surveys. The first consisted of approximately thirty artists gathered together in an arts and crafts fair held at the Empire State Plaza Mall in Albany, during the week of July 14-18, 1980. Artists represented many areas of the State including New Paltz, Glens Falls, Albany, Binghamton, and New York City. The second survey involved twenty-two artists who were participating in an art display held in the Colonie Center Shopping Mall in Colonie, NY, during the week of August 3-9, 1980. Several of these artists were residents of other states, including Colorado, Vermont, Maine and New Jersey. Both of these groups represented a wide range of art activities including jewelry, woodwork, metal work, stained glass, leather, and painting.

For the purpose of the surveys each artist was given a copy of a magazine article from the September 1979 issue of Sciquest, entitled" "The High Price of Art." This article provided a broad overview of some of the major hazards involved in working in the Arts. Attached to the article, was a survey sheet designed to solicit information to determine artists' awareness of possible hazards, and his or her thoughts on what action, if any, was needed to better protect those who work with art materials. Questions included: What other sources of information had the artist been exposed to concerning art hazards; any illnesses which the artist had experienced which may have been attributable to artist materials; precautions taken during the performance of art work; and, the types of legislative action which the artist believes is necessary for increased consumer protection.

The results of these surveys were astounding. In the first survey several artists immediately wrote letters in support of legislation which would require labels to appear on art materials. Sixteen of the thirty artists requested more information about

possible health hazards. Of the thirty, only one artist told us that he had had access to information similar to that found in the magazine article. One woman took from her purse a newspaper clipping which contained the name of a pamphlet which dealt with art hazards. This woman had searched for three months for this and/or similar information, but to no avail. My staff provided her with the address of the Art Hazards Project in New York City.

Many of the respondents in the second survey group were not New York State residents and thus not interested in State legislation. However, significant information was still obtained. Seven of the twenty-two artists mentioned that legislation mandating package labeling was essential. Not one of the artists stated that they had been aware of any information which described art hazards.

We have drawn three significant conclusions from the results of our surveys:

1. Artists as a whole, are unaware of the possible hazards involved in working with certain art materials.

2. The public should have greater access to available information concerning art hazards.

3. Artists who are provided with information on art safety show great interest and concern, frequently citing the need for legislation which would mandate the labeling of art supplies.

With these points in mind, I will now turn to the feasibility of art supply labeling and package inserts, paying particular attention to those arguments put forth by manufacturers who oppose labeling.

First, manufacturers often argue that there is not enough room on certain products to allow adequate labeling. Attention should be drawn, however, to the labeling found on fingernail polish and birth control pills, both of which are sold in very small containers. Further, Weldwood Contact Cement, manufactured by Robert's Consolidated Industry of California, is packaged in a small bottle. Yet, its bottle label contains encyclopedic information, including a list of hazardous ingredients, precautions concerning flammability, directions for first-aid care, and instructions on storage. Finally, the use of package inserts makes the space argument virtually suspicious.

Secondly, industry states that labeling would increase costs to the consumer as a result of the redesigning of present labels to meet specifications. In order to investigate this claim, my staff sent letters to manufacturers of art supplies, art supply stores, and artist guilds in order to determine what effect labeling legislation would have on industrial costs, and on present purchasing rates of art supplies. Although we are still awaiting some responses, our current information does not support the aforementioned claim. First, the letters which we have received from artists and artist guilds have supported labeling legislation. Second, of the three industries which have responded, one company places the chemical composition of the product on every tube which it produces, and the other two companies belong to the American Crayon, Water Color and Craft Institute which conducts a program that insures that products which bear its "child protection" seals contain no materials in sufficient quantity to be harmful or injurious to the human body, even if ingested. In operation since 1940, this institute has been commended by poison control centers and leading toxicologists as well as many school systems which rely on its safeguard.

Thirdly, many manufacturers claim that the labeling of its products may scare potential buyers. Such businesses are clearly placing profits over the safety of their

customers--a thought which I find simply appalling. Moreover, several companies are taking positive steps to find substitutes for the toxic substances which are present in their products. Those companies associated with the previously mentioned Crayon, Water Color and Craft Institute, Inc. represent a fine example.

On a local level, my staff found that Passonno Paints Co., of Watervliet, New York, developed a non-odorous paint for a preschool child who was having severe reactions to ordinary paint. Unfortunately, production of this paint was not continued because of the limited demand for it. I believe greater public awareness of the benefits of this new development and the hazards of existing products would encourage manufacturers to continue developing and producing safer products.

In conclusion, the surveys, interviews and investigations completed by my staff have convinced me of the importance of federal labeling standards for art supplies as is the responsibility of the government to ensure that consumers are aware of the possible hazards of products which he or she may purchase. However, legislation must create a balance between the responsibility of informing the consumer of possible hazards and maintained the consumers' right to choose the products which he or she so wishes. It is for these reasons that I whole-heartedly support Congressman Richmond's bill, H.R.6977.

In an effort to increase the public's awareness of this problem, and therefore, support for legislation in this area, my committee staff has drafted similar State legislation designed to protect New York State consumers from toxic substances present in artist supplies. Our bill defines the term "toxic substance" and would mandate that a conspicuous label be placed on products sold or distributed in the State which contain such substances. Secondly, all products containing toxic substances

which also contain known carcinogens, as determined by the National Cancer Institute, would bear an additional warning label. Thirdly, full disclosure of the ingredients contained in the product would appear on the outside label. Fourthly, a package insert accompanying the product would contain descriptions of the physical side effects associated with the product; the first aid care to counteract misuse; proper precautionary measures to avoid posible hazards; the proper ventilation systems to be used; and, if necessary, instruction on proper storage and disposal.

It is hoped that the efforts of the New York State Assembly Consumer Affairs and Protection Committee will enhance the passage of this legislation on the federal level. We shall continue our efforts, however, to adopt state legislation.

Thank you.

April 13, 1980

Congressman Fred Richmond
1707 Longworth House Office Building
Washington, D.C. 20515

APR 17 P.M.

Dear Congressman Richmond,

I have just received your letter and statement, and am writing to thank you for this vitally important work. As a photographer who can be counted among those who have experienced the frightening effects of the chemistry employed in photographic processing, I cannot sufficiently express my gratitude to you for your recognition of the seriousness and widespread presence of harmful materials.

You may be interested in a brief idea of my own experience: I developed erythema nodosum on the lower portion of both legs (the condition results from contact or inhalation allergy and is manifested by the appearance of oval red-purple lumps 1" -2" in size). My doctor suspected chemical allergy and suggested that I cease processing for six months. This I did, and the case cleared up in about a year.

When I returned to work with the chemicals (I use several very strong developers, the usual acid and fixer, and a chemical which I understand is now being suspected of very serious effects, called selenium toner) I completely revised the air conduction and filtering systems in my darkroom, and have luckily had no further

recurrence of that condition.

I must admit that what does remain with me is the fear of exactly what the long term results of using these materials (even granting good ventilation conditions) are. I hope that you will pursue the goals you are working toward, and help artists out of their forced ignorance of the products they are forced to use to continue their art. At the time of my experience, I received no cooperation from Kodak when I made enquiry as to which specific chemical I was using might be the cause of that peculiar effect. It was very disappointing to view their disregard firsthand.

Many thanks, and I will look forward to your progress, and to hearing more about it.

Sincerely yours,

Maida Sperling

Maida Sperling

DOROTHY DEHNER 33 FIFTH AVENUE NEW YORK, N. Y. 10003

April 10, 1980

Dear Representative Richmond:

I want to thank you for your letter about your interest in artist's materials. I support your legislation wholeheartedly. It is much needed.

I am a sculptor, and only last week learned through the Poison Bureau of the City of New York, that the wax I use in making my work throws off deadly fumes when melted.

The melting is inevitable as it must be melted in order to make it maleable enough to work with. Also the use of a heated sculpture tool is necessary in modeling the work, no matter what the exact technique the artist chooses. I had noticed an irritation of the throat and on asking the person at the Poison Bureau about the wax, (Mobile Wax, #2300) which I have used for years, was told the the fumes were carcinogenic, as it has a petrolium base.

You are probably well informed about the lost wax process, (cire perdue) used in making sculpture, but no artists who use this wax know of its dangers. I have been in touch with all the artists I know to inform them. An exhaust fan is necessary as well as a very special mask that blocks out fumes. I have not yet been able to obtain the mask, pending information from a qualified person in order to get the correct protection. This person is out of town briefly.

I noticed in your legislation that no mention was made of waxes used in making sculpture, (which is subsequently cast in bronze) I have notified my foundry of these dangers and of your pending legislation. Joel Meisner Foundry, Plainview, L.I. New York.

My gratitude and thanks for your interest, in an age when the consumers interest is too often disregarded, through both ignorance and greed.

Most sincerely, Dorothy Dehner

P.S. I enclose a short resume of my position as an artist.

Appl. 7A

P.S. #2: A great many sculptor's use this wax in the making of their work, mine is not an isolated case. It is so costly to cast in bronze that many artists use wood, stone, plastics or welded steel in which to work, but three foundries on L.I. are kept busy with the wax models. dd

DOROTHY DEMNER, SCULPTOR AND GRAPHIC ARTIST

Biographical Material

Solo Exhibitions: selected

Chicago Art Institute, Chicago, Ill. 1959
Albany Art Institute, Albany, N.Y. one solo, '64, one with David Smith, '48
Jewish Museum, NYC (retrospective,) 1965
Gres Gallery, Wash.D.C. '60's
Rose Fried Gallery, 1952
Willard Gallery, (nine exhibitions, 1955-1973)
Associated American Artists Gallery, (prints) 1973
Cornell University, 1964
Cummer Museum of Art, Jacksonville, Fla. 1969
Fort Wayne Museum of Art, 1975
Marian Locks Gallery, Philadelphia, 1976
Benson Gallery, East Hampton, 1975
etc. etc.

Group Exhibitions, selected

Metropolitan Museum of Art, NYC 1959
Museum of Modern Art, various dates, 1950's on
Whitney Museum of American Art, 1940's, 50's, & '60's
Guggenheim Museum of Art, (Exhib. of Hirshhorn Collection)
Chicago Art Institute, '59 - 72
Boston Museum of Fine Art '60's (from MOMA & Susan Hilles)
City Museum of Art St. Louis, '60's (from MOMA)
Cleveland Museum of Art, 1976
etc. etc.

Work in Public Collections:

Metropolitan Museum of Art, NYC
Museum of Modern Art NYC
Seattle Museum of Art, Seattle Wash.
Minnesota Museum of Art , Minneapolis, M.
Philadelphia Museum of Art, Philadelphia, Pa.
Hirshhorn Museum of Art, Wash. D.C.
State Dept. USA, Work in 15 Embassies
Chase Manhattan Bank, NYC
Columbus Gallery of Fine Art, Ohio
etc. etc.

Commissions: selected:

Union Camp, Corp. Wayne, N.J.
A.T.&T. Basking Ridge, N.J. (sculpture and drawings)
Rockefeller Plaza #50 65th Fl.
SouthWest Industrial Park, Atlanta Ga.
etc.etc.

Mr. LUKEN. Thank you, Mr. Richmond.

On behalf of the subcommittee, I would express appreciation to you and congratulations for your initiative in developing this investigation and doing this research, and in presenting such a comprehensive treatment of the subject here today—the subcommittee will be taking this up very seriously—and also for introducing the legislation.

On the subject of the legislation, I take it much of the labeling, some of which you pointed out here, that does exist, is it just inadequate? It is very general.

Mr. RICHMOND. Mr. Chairman, as I think you can see, it is inadequate. It is unscientific. The manufacturers clearly don't want to explain the side effects.

Mr. LUKEN. "Use with adequate ventilation" is a common one, isn't it?

Mr. RICHMOND. If they were told the possible harmful effects——

Mr. LUKEN. It is not specific enough, "Use with adequate ventilation."

Mr. RICHMOND. I think they also should say why they ought to use with adequate ventilation, because this product may cause dizziness or nausea or what have you.

Mr. LUKEN. And prescribe just what "adequate ventilation" means.

Mr. RICHMOND. Right.

Mr. LUKEN. Not a window cracked about 200 yards down the room or something, or in the hall. Would H.R. 6977 prescribe sufficiently in detail specific types of labeling?

Mr. RICHMOND. Mr. Chairman, we have five suggestions. First of all, the label should contain the name of each chemical in the product; the potential hazards associated with the misuse of these chemicals; how to avoid these health hazards; the antidotes to the health hazards; and finally, how to dispose of the product safely. As we have learned, much to our horror, we just can't pour things down the sink any more.

I think all this information could be contained in a very clean label. There is plenty of space on most art supplies, for an informative label.

Mr. LUKEN. The chemical compounds described would be those that would have certain potentially harmful properties.

Mr. RICHMOND. Yes.

Mr. LUKEN. For example, automatic labeling of compounds, if they have been determined by specified national and international tribunals to be carcinogenic, they would have to be specified, wouldn't they?

Now, some have suggested that automatic labeling denies an affected industry due process of law by not allowing it to present its case to the Consumer Product Safety Commission prior to any regulatory action. Do you have any comment on that?

Mr. RICHMOND. My only feeling is, this legislation is so necessary and so obviously pertinent, particularly for the 54 million people who use these products, that I think we ought to cut all possible redtape and just get it on the books.

You know, we are really not asking the manufacturers to do too much. All we are asking them is to give the consumer a fair chance.

Mr. LUKEN. Well, I have no further questions. Does counsel have any?

Mr. MCLAUGHLIN. No. Thank you, Mr. Luken.

Mr. LUKEN. Again, Mr. Richmond, you should be proud of this legislation. We will be considering it, and we will be calling witnesses in affected industries from the profession who will be commenting on it. Thank you for appearing before us. If you wish, at any time, you may join us here on the panel.

Mr. RICHMOND. Thank you.

Mr. LUKEN. Is the panel here of Ms. Shirley Levy, Dr. Albert Elsen, and Dr. Donald Hoffman? Would you come forward? I understand that all three of you are artists. Is that right?

Mr. ELSEN. No, I am an art historian.

Mr. LUKEN. All right. Is there any particular order that you would want to go in? Do you all want to present something, or is it through one spokesperson? Each one has a statement.

All right, Dr. Hoffman, it looks like you have been elected by majority vote.

STATEMENTS OF DR. DONALD H. HOFFMAN, DIRECTOR, COUNCIL ON AGING/DONOVAN FELLOWSHIP PROGRAM, UNIVERSITY OF KENTUCKY; SHIRLEY LEVY, MEMBER, EXECUTIVE BOARD, BOSTON VISUAL ARTISTS UNION; AND DR. ALBERT E. ELSEN, PRESIDENT, COLLEGE ART ASSOCIATION

Dr. HOFFMAN. Thank you, Mr. Chairman.

Mr. LUKEN. You didn't have a written statement?

Dr. HOFFMAN. Yes, I did.

Mr. LUKEN. Without objection, it will be received.

I believe I neglected to state that without objection, the statement and the submissions of Congressman Richmond will also be received.

Proceed, Dr. Hoffman.

Dr. HOFFMAN. Thank you, Mr. Chairman.

I take the liberty of submitting this testimony to your committee in support of H.R. 6977, for in my opinion there is a great need for more clearly labeled warnings, including first aid information, on the packages of many art materials now in common use by a large number of older persons.

I serve as director of the council on aging at the University of Kentucky. About 150 of our people are in drawing and painting classes. Another 200 or so are matriculating in the college of fine arts and are taking many visual arts courses.

I have also worked for many years in nursing homes, nutrition sites, and other senior centers where older adults are frequently utilizing art materials. It is a wide range of experience. Photography, printmaking, painting, sculpture, and the crafts are all part of their experience. Most of the art experiences that they have take place either in their home situation, their kitchen or on their dining room table, or in all-purpose rooms.

For example, in a nutrition site, older adults eat an afternoon meal, but they also partake in art experiences.

70-237 O - 81 - 10

I have found through many years of interaction that improper care has been taken in the past for the utilization of many materials that Congressman Richmond had displayed in front of you. Tables are not adequately covered, because instructors who work with older adults do not know that they are working with materials that are dangerous or toxic.

Many older adults in the home situation leave dishes on the table while they work in a small corner of their kitchen. They have many dangers, such as fire danger from a pilot light burning while they use lacquer sprays, and in many instances are unaware that there are dangerous chemical compounds.

Why are they unaware? Older adults were brought up in the twenties. I don't believe the chemical explosion had quite begun at that time, so they are just not aware in many instances that there are such dangerous materials.

Art experience is not thought of as dangerous but as leisure time activity, so people feel the same way about the art materials that they work with. Also, there is great fire danger. There can be skin problems, older adults in general are more prone to problems with toxic materials, because in many instances they suffer from chronic illnesses.

I won't take much more of your time, except I must confess and tell you that as I work with older adults, there are millions who are going to be involved with art materials. It is becoming a very popular leisure experience.

In many instances, the sense awareness of older adults deteriorates, this deterioriation sometimes causes them a problem in reading the warnings that are on the materials.

I have a label here, and I would like to submit it as a perfect example of an excellent label. [See p. 147.] It is large enough for older adults to read. On smaller packaging, it is impossible for the manufacturer to put large type and easily read type and this creates a problem. I don't know if many older adults working in the arts would search for a magnifying glass to read a warning. I think perhaps the tubes are too small for a warning to be properly placed, and I might suggest that a paper will need to be included with certain materials.

Thank you for your time.

Mr. LUKEN. Thank you, Dr. Hoffman.

[Testimony resumes on p. 149.]

[Dr. Hoffman's prepared statement follows:]

STATEMENT OF DR. DONALD H. HOFFMAN, DIRECTOR, COUNCIL ON AGING/DONOVAN FELLOWSHIP PROGRAM, UNIVERSITY OF KENTUCKY

During the past eight years increased leisure time, early retirement and a search for self-fulfillment has led many older adults to explore various aspects of painting and drawing, photography and filmmaking, printmaking and the crafts. The arts explosion has not been limited to a single geographic area but has been more general in nature. Pursuit of the visual arts with older adults is in renaissance. Model programs have grown to maturity in New York City, Rhode Island, Iowa, Atlanta, South Carolina and on the West Coast. Most of these programs encompass all of the arts and include visual arts activities as an integral aspect of their program.

Programs are usually delivered to small groups in class-oriented settings at senior centers, nutrition sites, community arts centers and high-rise apartment complexes. In some isolated instances programs are delivered directly to the home.

For the most part, society believes visual arts pursuits to be a harmless pastime. Many novice artists and instructors suffer from the misconception that arts materials themselves are also harmless.

However, many visual art materials, especially those utilized during painting, decoupage, ceramics, jewelry making, crafts, sculpture and fabric decoration may become potential health hazards if utilized without proper precautions or sensible classroom organization. It is important to realize that all of the hazards associated with arts materials can be controlled with adequate ventilation, table coverings and a common sense attitude concerning safety. Some activities, however, may require extensive ventilation

and thus may be unsuitable for pursuit in home situations.

New technology has increased the production of chemical compounds, glues, pigments, plastics, epoxys, coating, etc. for the use in the arts. Artists, recreators, teachers, aging practitioners must learn to control their effect.

Potential hazards are compounded for older adults in three ways. First, arts activities are not held in high esteem and may be considered a playtime leisure activity; thus, senior centers, nursing homes, local aging agencies and recreation programs often provide instructors with limited arts background. Many times these instructors have minimal understanding of the visual arts, of design, and especially of the toxic nature of art materials.

Secondly, the effects of toxic chemicals found in some art materials compounds the problem of senior adults already suffering from serious chronic illness.

A third factor in the effects of toxic art materials on older adults is lack of control of the environment in which arts programs are usually pursued.

Environmental Factors:

In many instances, food stuff and eating utensil contamination, as well as pollution of tables, chairs and the atmosphere increase the possibility of breathing difficulties, poisoning and fire hazard, and can be the direct result of hazardous art material utilization.

Air Pollution. Various spray paints, lacquers and plastic substances find general use during sculpture, decoupage and painting techniques. If not used with maximum ventilation these chemicals can produce nausea, drowsiness, may cause fainting and add to breathing difficulties encountered by emphysema sufferers while increasing

the problems associated with heart and kidney disease.

Contamination of Food Stuff and Kitchen Utensils. Many paints and lacquers are utilized in all-purpose facilities on tables also used for the serving of food. Chemicals find their way into uncovered residual materials that come in contact with the surfaces of tables and chairs. Obviously the toxic nature of these materials can lead to the ingestion of poisonous substances. Ingestion adds to, and increases, the vulnerability of individuals suffering from heart disease or other chronic disorders and adds greatly to their risk.

Fire Hazard. Many products such as oil paints, lacquer, turpentine, linseed oil produce highly flammable vapors, definite fire hazards in multi-purpose centers, nursing homes and individual residences. Photographic and silk screen materials, plastics and some glues produce similar hazards.

Chemical Burns. Full-strength chemicals such as some household detergents, acids utilized for making jewelry, certain chemicals utilized in ceramics and petroleum-based paint thinners and lacquers can produce painful first and second degree burns on hands and arms.

Allergic Reactions. Various substances utilized in printmaking, decoupage, ceramics, jewelry, sculpture and silk screen can be the catalyst that develops skin rashes, hives, swelling, skin sensitivity and peeling of the skin.

Eye Damage. Chemicals of any type can be extremely hazardous especially where the eyes are concerned and caution must be exercised in the pouring or mixing of acid cleaners and solvents.

Organizing the classroom situations for safe pursuit of arts

activities requires careful control of atmosphere, materials storage, and movement.

In a new book, Artist Beware, Michael McCann lists materials, inherent risks of, and proper precautions for, the handling of toxic art materials. Some suggestions for classroom organization are:

1. Remove all articles from tables to be used.
2. Cover work surfaces with a non-porous covering such as plastic.
3. Confine the use of spray lacquers, paint thinners or items with hazardous warnings on the label to a room away from the general food service area, away from open flame and where maximum ventilation is available. Use a spray booth especially when using lacquers.
4. As a precautionary measure, provide dust masks, safety goggles, rubber gloves when utilizing chemicals, sprays, sanders, grinders or power tools.
5. Be absolutely sure to follow the suggested safety precautions and labeling provided by manufacturers.
6. Whenever possible, utilize materials listed as non-toxic on the label.
7. Provide adequate time and access for individuals to wash their hands properly after the activity and before eating.
8. Provide a metal cabinet for the storage of, and a covered metal trash can for the disposal of, toxic and flammable materials. Be sure to keep the cabinet and trash can away from high heat.
9. Provide adequate quarters for special equipment such as a ceramic kiln, power tools, chemical storage and enameling materials.

Art materials can be poisonous or flammable, but if treated with respect and common sense, will not become hazardous additions to the life of older adults pursuing the arts.

NAZ DAR

screen process products

Manufactured By NAZ-DAR COMPANY Chicago, Illinois 60622 • Since 1922

No. VF-184
VINYL
SCREEN WASH

CONTAINS - ACETONE AND XYLOL

DANGER! HARMFUL OR FATAL
IF SWALLOWED, VAPOR HARMFUL
EXTREMELY FLAMMABLE.

Read other cautions on back panel.

ONE GALLON (3.785 LITERS)

MADE IN U.S.A.

CONTAINS - ACETONE AND XYLOL

DANGER! EXTREMELY FLAMMABLE, VAPORS HARMFUL, MAY ALSO CAUSE FLASH FIRE.

Keep away from heat, sparks and open flame. Vapors may ignite explosively. Vapors may spread long distances. Prevent build-up of vapors. Extinguish all pilot lights and turn off heaters, non-explosion proof electrical equipment and other sources of ignition during use and until all vapors are gone. Use only with adequate ventilation. Avoid prolonged or repeated breathing of vapor or spray mist. Avoid contact with eyes and skin. Keep closures tight and upright to prevent leakage. In case of spillage, absorb and dispose of in accordance with local applicable regulations. Keep container closed when not in use. For additional information, see catalog.

FIRST AID: In case of skin contact, wash with soap and water; for eyes, flush with plenty of water for 15 minutes and get medical attention. If affected by inhalation of vapor, remove to fresh air. Restore breathing if required. If swallowed, CALL A PHYSICIAN IMMEDIATELY. DO NOT induce vomiting.

KEEP OUT OF REACH OF CHILDREN NDS-5

NAZ DAR

screen process products

Manufactured By NAZ-DAR COMPANY Chicago, Illinois 60622 • Since 1922

No. 44-180
THINNER

CONTAINS – ETHYLENE GLYCOL
MONOETHYL ETHER ACETATE

CAUTION! COMBUSTIBLE, BREATHING OF VAPOR MAY CAUSE IRRITATION.

Read other cautions on back panel.

ONE GALLON (3.785 LITERS)

MADE IN U.S.A.

CONTAINS – ETHYLENE GLYCOL
MONOETHYL ETHER ACETATE

CAUTION! COMBUSTIBLE, BREATHING OF VAPOR MAY CAUSE IRRITATION.

Keep away from heat and open flame. Use only with adequate ventilation. Avoid prolonged or repeated breathing of vapor or spray mist. Avoid contact with eyes and skin. Do not take internally. Keep container closed and upright when not in use. In case of spillage, absorb and flush with large volumes of water immediately.

FIRST AID: In case of skin contact, flush with plenty of water; for eyes, flush with plenty of water and get medical attention immediately. If affected by inhalation of vapor, remove to fresh air. Restore breathing if required. If swallowed, CALL A PHYSICIAN IMMEDIATELY. Induce vomiting.

KEEP OUT OF REACH OF CHILDREN. NDS-7

Ms. Levy, we have your written testimony, eight or nine pages. It will be received without objection. You may give us your version of what we should be doing here, any way you want. You can either read it or summarize it, or improvise in any way. We will receive it in the record.

STATEMENT OF SHIRLEY LEVY

Ms. LEVY. My name is Shirley Levy. I am a professional artist. The credentials are in the written testimony.

For the past 11 years, I have taught art to over 2,000 students in the public schools in Braintree, Mass. The art materials order form that we use is 40 pages long, and has over 300 items on it. Almost all of the materials carry little or no labeling that we receive, and they carry little or no labeling as H.R. 6977 would require, and I think that art teachers need.

Almost all the art materials do not have the CP or the AP seal of approval from the American Crayon, Watercolor, and Craft Institute, who is attempting to insure the safety of young children.

Maybe this is the result of the lowest bid price system that is prevalent in the public school system. Art teachers may have little or no input into what material is actually chosen. Proper labeling could become a very convincing argument.

Also, many of the art supplies are ordered by elementary administrators for use by their classroom teachers, and these people also very much need the information.

It must be remembered that children are physiologically more susceptible and at higher risk than adults, and it must be remembered that they are not always, especially with elementary children, going to remember to always use the proper precautions that we may try to teach them.

Mr. LUKEN. If I could interrupt, some of these materials are specifically for children. Is that right? Like crayons, generally speaking.

Ms. LEVY. Well, I know many professional artists who use crayons in their work.

Mr. LUKEN. The same kind?

Ms. LEVY. Yes, the same kind.

Mr. LUKEN. So you are really not dealing with products that are specifically for children then?

Ms. LEVY. Not the way things are being ordered in today's marketplace, no.

My testimony is based on the following premise. Many art materials that my fellow consumers use contain harmful substances, and while it is also true that many art materials contain no hazardous substances, the fact is that the consumer has few or no guidelines for making this distinction.

This would not be serious if we users could determine content from talking to the people who are selling the art materials, but these people are equally uninformed. The whole situation, again, would not be serious if family physicians were familiar with occupational medicine. However, they are not, and many are unwilling to admit it.

Something can be done about this dismal situation, something that is positive, useful, and relatively inexpensive. That is passage of H.R. 6977.

An argument against this bill's passage is that if, say, a paint manufacturer were to list his or her products' ingredients, those ingredients would be known to competitors. This argument has no substance, however, since all art material manufacturers either own or have access to laboratories in which they constantly break down and analyze competitors' products. Thus, they would learn nothing new from ingredients lists.

And we consumers certainly pose no threat to the manufacturers, for we are interested in using, not making, these materials. In fact, I would have thought that the art materials manufacturers would have a vested interest in ensuring that we consumers are alive and healthy enough to continue to buy and use their products, as well as to spread the good word about which products combine quality with safety.

I realize that the United States is known for producing products that need to be replaced quickly, but it seems that the art materials manufacturers have a new twist: the throwaway or replaceable consumer.

To repeat most emphatically: If consumers had the pertinent information on the label, they could make informed decisions based upon their own medical history and life/work pattern. If consumers could tell their physicians what toxic substances they use, and how they use them, the physicians would then be able to diagnose, treat, and help prevent chronic or acute effects of exposure to hazardous materials.

Consumers could adjust their work conditions in relation to ventilation, length of time of exposure, and how "hands on or in" they were with the hazardous chemicals.

It is also important to note that the toxic material in one product may not by itself be lethal, but when the consumer is using several products, each with a hazardous chemical, the total body burden may be too great, with inevitably disastrous results.

I have been a member of the advisory board for occupational hazards since its inception, and for the past several years have been a member of the executive board of the Boston Visual Union. We are an organization of over 1,000 professional artists in the New England area. Our primary aim is to insure the survival of the visual artists in our society.

We reprint articles from the Art Hazards newsletter to over 2,000 people in our area. We maintain files of health hazards information, and specifically resources for safety equipment, which, unfortunately, to this day is not available at the primary source of art materials, with the art materials retailer.

We sell pamphlets on health hazards. We sponsor lectures and displays on health hazards. Importantly, we refer people with health hazards problems or questions to the Center for Occupational Hazards in New York City.

Our educational services are essential to our artists. There are many artists' organizations across the country who do provide these services, but what about consumers of art materials who are not associated with the service organization? How do hundreds of

thousands of other professional artists, art teachers, amateur artists, students, and well-intentioned parents of children become aware of the hazards in the materials they use?

I have attended classes and conferences on health issues for artists in San Francisco, Maine, Massachusetts, and Washington, D.C. I have seen the consciousness of artists raised. I have seen the number of concerned artists grow dramatically.

However, knowing how to handle hazardous art materials is only a foundation—not a replacement—for having the proper information on the label in the first place. Without those labels, all the knowledge in the world is useless. The label on the product is the primary resource.

My written testimony has many horror story illustrations, but let me relate some to illustrate a problem that has not been brought up at these hearings to date. That is, the difficulty artists have when they do try to find out about the hazards in the materials that they use.

A potter wrote to two companies that supplied his ceramic materials. One responded with some information, and the other did not respond at all.

David, a metalsmith, has been unable to find out from his distributor what the ingredients are in the following materials: fluxes, and what is produced when burned off; patinas; acids which are packed by color name only, like green patina, and marked simply "hazardous"; solders and polishing compounds, with no list of ingredients but definitely a problem with inhalation of dust; and microcrystalline wax, no warning on label but commonly gives off a fume when heated that causes headaches.

Jamie, an enamelist, has been trying to find out what is in paste flux after a student almost passed out from overexposure. Word of mouth among artists says that there are harmful fluorides in flux, but it has not been confirmed. Jamie orders from large distributors that do not have any information to give him. He would like acid bottles to say what neutralizes them, because in the panic of an accident, people often cannot remember.

A printmaking teacher became aware of hazards 18 years ago when a student broke out with a rash from turpentine. With a lot of persistent sleuthing, he discovered industry had already researched and developed products for safe use that he could substitute for the turpentine.

Mr. LUKEN. I am sorry to interrupt you in midrhetorical flight, but I was hoping perhaps we could get it in, but it doesn't appear that we can. We are going to have to go vote. So, if you will excuse us for about 5 minutes, we will be back.

[Brief recess.]

Mr. LUKEN. The subcommittee will resume.

Ms. Levy, you can perhaps pick up the thread where you left it.

Ms. LEVY. I think I can.

In conclusion, I would like to relate an event that happened to me recently. I hired some men to sand and urethane my wood floor. The label on the product they were using carried much of the information that H.R. 6977 would require. I would like to read that warning to you. It is lengthy, because it is so thorough. As it is in the written testimony, I will skip to the very important last sen-

tence: "Marketed solely for industrial use." Note carefully the words, please, "Marketed solely for industrial use."

Why, we ask, can the consumer not get equal protection? Why can we not have labels that will do us some good? Apparently, industry takes care of its own, but let the consumer beware.

Art material manufacturers act as a poor parent might. They say they are protecting artists because their scientists say there is nothing hazardous in the materials, but they are doing another thing. The artist is without access to proper labeling. He remains a dependent child. The industry scientists are only protecting the parent who pays them.

With good parenting, children grow into independent adults, honoring and respecting their parents. With good labeling information, artists will spread the word about which products combine quality and safety, which art material manufacturers are looking out for the survival of the artist.

The situation seems like a horse race. Some horses don't have their hearts in it. Some horses' desires will be activated by the start of the race. Some horses are eager to race, but everybody has to wait for the bell. It seems the case that art material manufacturers are waiting for a bill from you honorable legislators. It is very unfortunate it is not more conscience that would induce proper labeling.

Thank you for giving your time and attention to an issue that is vitally important to me, my colleagues, and millions of artists and our consumers throughout the Nation, and thanks especially to Congressman Richmond and his staff.

Mr. LUKEN. Thank you, Ms. Levy. I am sure that all the students in the country thank you also for your interest and the presentation that you have made, and the ideas you have brought here.

[Testimony resumes on p. 161.]

[Ms. Levy's prepared statement follows:]

STATEMENT OF SHIRLEY LEVY, MEMBER, EXECUTIVE BOARD, BOSTON VISUAL ARTS UNION

My name is Shirley Levy. I am a professional artist. My prints and large-scale drawings have been shown in solo exhibitions, juried exhibitions, and galleries in Boston, Washington, Chicago, and San Francisco. Outstanding Young Women of America and Who's Who in American Art list me in their publications. I am the consulting editor to the recently published book for visual artists "Are You Ready to Market Your Work?"

For the past 11 years, I have taught art to over 2000 students in the public schools in Braintree, Massachusetts. The art materials order form is 40 pages long and has over 300 items. Almost all of these art materials carry little or no labeling of ingredients or information on precautions to take when using the material, the physical side effects that might occur, how to counteract such effects, and how to dispose of toxic substances. Almost all the art materials do not have the CP or AP seal of approval from the Crayon, Watercolor, and Craft Institute which attempts to ensure the safety of children's art materials. Yet, according to the "Health Hazards Manual for Artists", children are at much higher risk physiologically than adults from exposure to toxic materials. Secondly, children cannot be depended upon to either understand the need to carry out precautions or to effectively carry them out on a consistent basis.

For the past seven years, I have been a member of the Executive Board of the Boston Visual Artists Union (BVAU); and I have been a member of the Advisory Board of the Center for Occupational Hazards since its inception. The Boston Visual Artists Union is an organization of 1000 professional

artists in the New England area. Our primary aim is to ensure the survival of the visual artist within our society.

Visual artists buy and use a great variety of art materials to create the art work upon which our cultural institutions depend. The cultural industry in Massachusetts employs more than 14,000 people, has a total economic impact upon the state's economy of more than $200 million, and attracted $23 million in federal funds to the Commonwealth in the fiscal year that just ended. Clearly, visual arts is big business.

My testimony is based on the following premise: Many art materials that my fellow consumers and I use contain hazardous substances. And, while it is also true that many art materials contain no hazardous materials, the fact is that the consumer has few or no guidelines for making this distinction. This would not be serious if we users could determine content from talking to the people who are selling the art materials, but these people are equally uninformed. In fact, their frequent ignorance of the Material Safety Data sheets often places tham at equal risk with us artists.

This whole situation, again, would not be so serious if family physicians were familiar with occupational medicine. However, they are not; and many would be unwilling to admit that fact.

Something can be done about this dismal situation - something that is positive, useful, and not expensive - certainly it is cheaper than a single lawsuit. Passage of H. R. 6977 would result in the improved labeling of art materials to provide the needed information at the time of use.

An argument against this bill's passage is that if, say, a paint manufacturer were to have to list his or her products' ingredients, those ingredients would be known to competitors. This argument has no substance, however, since all art material manufacturers either own or have access to

laboratories in which they constantly break down and analyze competitors' products. Thus, they would learn nothing new from ingredient lists.

And we consumers certainly pose no threat to the manufacturers, for we are interested in using, not making, these materials. In fact, I would have thought that the art materials manufacturers would have a vested interest in ensuring that we consumers are alive and healthy enough to continue to buy and use their products, as well as to spread the good word about which products combine quality with safety.

I realize that the United States is known for producing products that need to be replaced quickly, but it seems that the art materials manufacturers have a new twist: the throw-away or replaceable consumer.

To repeat most emphatically: If consumers had the pertinent information on the label, they could make informed decisions based upon thier own medical history and live/work pattern. If consumers could tell their physicians what toxic substances they use, and how they use them, the physicians would then be able to diagnose, treat, and help prevent chronic or acute effects of exposure to hazardous materials. Consumers could adjust their work conditions in relation to ventilation, length of time of exposure, and how "hands on or in" they were with the hazardous chemicals.

It is also important to note that the toxic chemical in one product may not by itself be lethal but when the consumer is using several products, each with a hazardous chemical, the total body burden may be too great, with inevitably disastrous results.

Making concern for the physical survival of the visual artist their highest priority, the BVAU provides the following educational resources:

1. Reprinting articles from the Art Hazards Newsletter in our monthly newsletter which is circulated to 2000 people in the New England area.
2. Maintaining files of health hazards information and resources for safety equipment.

3. Selling pamphlets on health hazards
4. Sponsoring lectures and displays on health hazards.
5. Referring people with health hazards problems or questions to the Center for Occupational Hazards in New York City.

The Materials Committee of the Boston Visual Artists Union began collecting Safety Data Sheets on many art materials some four years ago. We sent out numerous letters to the product manufacturers and distributors. Some replies were prompt and complete; some did not answer; and still others referred us to their suppliers for the information. The complications of accumulating and maintaining such a file were so overwhelming that we re-evaluated the situation, and came to the conclusion that the Center for Occupational Hazards was our most important and efficient resource.

The BVAU's educational services are essential to our artists. But what about consumers of art materials who are not associated with a service organization? How do hundreds of thousands of other professional artists, art teachers, amateur artists, students, and well-intentioned parents of children become aware of the hazards in the materials they use?

I have attended classes and conferences on health issues for artists in San Francisco, Maine, Massachusetts, and Washington, D.C. I have seen the consciousness of artists raised. I have seen the number of concerned artists grow dramatically. HOWEVER, KNOWING HOW TO HANDLE HAZARDOUS ART MATERIALS IS ONLY A FOUNDATION - NOT A REPLACEMENT - FOR HAVING THE PROPER INFORMATION ON THE LABEL IN THE FIRST PLACE. WITHOUT THOSE LABELS, ALL THE KNOWLEDGE IN THE WORLD IS USELESS. THE LABEL ON THE PRODUCT IS THE PRIMARY RESOURCE.

Lest you think I am understating the case, a few illustrations of actual events should change your mind. Suzanne was working in one studio while her friend was spraying paint in an adjoining studio. There was no door between them to prevent a fine mist of spray travelling unseen into her room. As she

wnet home, dizziness swept over her. She walked like she was drunk. Her hands were uncoordinated at the dinner table and these effects lasted into the night. The fear of not knowing what was happening to her and of how long this acute reaction would last was unnerving.

Howard, a glass artist and teacher, has been deeply involved with uncovering the hazards of his materials. He took the opportunity at a recent exhibition at an art school to put up a display on hazards. Free handouts available on the various media were exhausted before the opening was over. Traditionally, colored glass is obtained by mixing chemicals into the glass. These chemicals are not labelled with any warnings, but they are hazardous and they are still used in many glass studios. Howard uses only a non-hazardous kind of color rod to give his glass color but in his work he also uses a cold cure or organic resin and phosphoric acid. His distributor did not know any information about the product. Howard does wear a full face mask when working, but still gets black rings under his eyes when he uses the cold cure process.

Tim, a stained glass artist, is his own best horror story when he teaches his students the hazards associated with the media. In 1976, Tim was working 16 hour days on his stained glass with no ventilation. He began to feel run-down and thought he had the flu. Then his feet began to feel very heavy, the joints in his hands were inflamed and he could not close his hands. A visit to the family doctor and a lead test confirmed that he had a severe case of lead poisoning. He went through 8 weeks of a calcium treatment to cleanse his system. He has since improved the ventilation in his studio, but the lead channel that is used by stained glass artists is still not labelled.

Andy has left printmaking and ceramics because the materials used aggravate her asthma too much. She has turned to the fiber arts for her creative expression, but is careful of the fumes and dusts while mixing dyes, and fly-away fibers while weaving.

A potter wrote to two companies that supplied his ceramic materials. One responded with some information and the other did not respond at all.

David, a metalsmith, has been unable to find out from his distributor what the ingredients are in the following materials: fluxes (and what is produced when burned off), patinas (acids which are packaged by color name only like green patina and marked simply "hazardous"), solders and polishing compounds (with no list of ingredients but definitely a problem with inhalation of dust) and microcrystalline wax (no warning on label but gives off a fume when heated that causes headaches).

Jamie, an enamelist, has been trying to find out what is in paste flux after a student almost passed out from over-exposure. Word of mouth among artists says that there are harmful fluorides in flux, but it has not been confirmed. Jamie orders from large distributors that do not have any information to give him. He would like acid bottles to say what neutralizes them because in the panic of an accident people often cannot remember. Jamie knows that the small size of the enamel particles necessitates a dust mask to be used when sifting, but there is no warning on the label. In addition lead oxide fumes are given off in the process of heating enamels, but again there is no warning about the necessity of proper ventilation of the kiln.

Elsa, a weaver, worked in her basement on a frameloom weaving jute. The more she worked, the more fibers floated around and ended up as balls on the basement floor. She estimated that there is 20% waste of fiber with jute. Unfortunately in that basement situation she found herself coughing up black mucous from the black jute. She had extensive allergy tests and now receives specific allergy shots so she can continue to work with the fibers she is allergic to. Though she has a special ventilation system to use when dying fibers and even with her wearing a mask, she gets headaches, blows out colored mucous, and smells the dye outside her studio. In response to inquiries about disposing of her cold water dyes in her septic tank, her

distributor stated that the dye should lose its potency within an hour.

A printmaking teacher became aware of hazards 18 years ago when a student broke out with a rash from turpentine. With some persistent sleuthing, he discovered Industry had already researched and developed products for safe use that he could substitute for the turpentine. Recently his art school paired a teacher in each of the art media with a chemical engineer to investigate the art materials within the studios. The final report pinpoints the hazardous materials (most were unlabelled) and how to use them safely in the schools's studio.

An etcher was told by her doctor to stop her etching work or the liver disease she had developed would cause her death within the year. Another etcher working in a small house developed psychotic symptoms that disappeared when she went on vacation. She improved ventilation and the symptoms did not reappear.

An artist is so sensitized to dust that just walking into her woodworking studio plugs her nasal passages. She wears a respirator faithfully now.

Lisa learned of the hazards of her weaving materials from other artists. Rumors abound, facts are few and it is difficult to sort out information from misinformation. Lisa uses a respirator to protect herself from flying fibers from not tightly plyed jute and sisal fibers and from powder that comes off dyed fibers easily. Her major supply source has written their own information sheets which are available if you ask. Unfortunately, since the major portion of the suppliers' business is mail order, most consumers are not aware of the information available.

Jessie, a printmaking teacher, began teaching in the 50's. Her high school students used benzene for clean-up because benzene is what she had used as a student. She was unaware that benzene was hazardous until she attended a lecture by Michael McCann of the Center for Occupational Hazards. Benzene causes chronic poisoning from the cumulative effect of exposure to

small amounts. Its effects are destruction of bone marrow, leading to loss of red and while blood cells, and sometimes leukemia.

A painter has successfully recovered from mercury poisoning that was diagnosed from both hair and urine tests. The cause was traced to the paint she used in great quantity for her murals.

In conclusion, I would like to relate an event that happened to me recently. I hired some men to sand and urethane my wood floor. The label on the product that they were using carried much of the information that H. R. 6977 would require. I would like to read that warning to you now.

Danger: COMBUSTIBLE: HARMFUL OR FATAL IF SWALLOWED. Contains Mineral Spirits. Keep away from flame.

When applying, forced ventilation must be sufficient to reduce the vapor level below the established TLV limits. In the absence of such ventilation, the operator must wear a chemical respirator applicable for organic vapor NIOSH 230.

Avoid prolonged or repeated contact with skin. Do not take internally. Close container after each use. In the case of spillage, absorb and dispose of in accordance with local regulations. Do not use in the presence of food stuffs. In the case of fire, use foam, dry chemical or CO2 extinguisher.

FIRST AID: INHALATION: Remove person to fresh air. If breathing difficulty persists or occurs later, call a physician and provide label information. EYE CONTACT: Flush with water for 15 minutes. SKIN CONTACT: Wash thoroughly with soap and water. If swallowed, DO NOT INDUCE VOMITING. Call a physician immediately. KEEP OUT of reach of children.

MARKETED SOLELY FOR INDUSTRIAL USE

DANGER: COMBUSTIBLE VAPOR HARMFUL see caution statement elsewhere on label.

Note carefully, please, the works "marketed solely for industrial use." Why, we ask, can the consumer not get equal protection? Why cannot we have labels that will do <u>us</u> some good? Apparently industry takes care of its own - but let the consumer beware!

Thank you for giving your time and attention to an issue that is vitally important to me, my colleagues, and millions of artists and art consumers throughout the nation.

Dr. Elsen? We have your written testimony, and without objection it will be received. You may proceed in any way you want.

STATEMENT OF DR. ALBERT E. ELSEN

Dr. ELSEN. I am here to testify on behalf of H.R. 6977, because a little more than 2 years ago I introduced Congressman Fred Richmond to the subject of artists' occupational health hazards. At that time, I urged him to undertake the research that would lead to new legislation, and to the gratification of the profession, he has done this.

I am not an artist. My own involvement with this subject came about in my role as the president of the College Art Association in 1974. That is the national organization of art historians and artists who teach.

In 1974, responding to the requests of the artist constituency of the CAA, I held an open forum in Detroit. Part of the panel consisted of Dr. Michael McCann. It was probably the largest artist session ever held by this association, in which a lot of testimony was introduced about the problem, and it convinced me that the national organization had to do something about it.

Accordingly, I instructed the then vice president, the dean of Cooper Union, George Sadek, to coordinate our activities, and the result was the production of a very important studio guide, a guide to safe practices in the arts and crafts.

One of the purposes of my testimony is to give some indication of the matching effort that artists are making with regard to this problem, to reassure the committee that they are not placing total reliance on the Federal Government to solve it.

I would refer also to the College Art Association's Code of Ethics for Artists and Artists Who Teach. In that code of ethics, which is quoted in my written testimony, the CAA speaks to a question that was posed of me when I was invited to appear before this subcommittee.

Namely, it is a universal problem, and the artists' code of ethics says that every artist who teaches has a moral responsibility to inform himself or herself of the dangers of the materials and equipment that will be used in the course, so that the code of ethics is fine, you might say, for those who belong to the College Art Association.

We rely, upon word of mouth to alert others who teach in the elementary schools and so forth, of this moral obligation.

As an art historian whose special field of competence is modern art, I come into contact with many living artists, and I can say that almost without exception, all artists that I have met have at one time or another dropped a material that they were using out of fear, out of fear for their health.

Unfortunately, many artists have either incurred totally debilitating illnesses or death as a consequence of their materials, and I have spelled out in my written testimony several cases, but I would like to refer to two in particular, because they are people I know personally, and they are well-known artists, both on the west coast and nationally.

The painter, Jay De Feo, worked for 6 years on one large oil painting that weighs 1,000 pounds, and is called "The Rose." She

used black and white lead-based paints. She told me that she experienced severe gum problems and eventual loss of almost all her teeth while working on this painting. Her dentist could see no reason why a young person should experience these difficulties. Jay had thought it took a lifetime's exposure to leaded paints to become seriously ill. When she finally switched to acrylics, her condition stabilized.

The single most tragic story of which I am aware is that of the artist Inez Storer, now teaching at U. C. Davis. When she was younger, she painted with toxic materials. During that time she had two spontaneous abortions, but delivered four children, all born with birth defects. All had club feet and separation of their teeth. One had hip displasia; the second a curvature of the spine; the third had a cleft palate; the fourth had a severe deformation of the jaw.

Due to the then poverty of Inez and her law student husband, medical care was paid for by the Babcock Foundation and Marin County. Her doctors do not see any genetic cause in the parents for the childrens' deformities. There is no more ardent advocate of H.R. 6977 than Inez Storer.

One of the most recent cases brought to my attention by his lawyer is that of a Detroit designer who died in 1976. He worked for an architectural firm doing pastel renderings in a new, prize-winning building that had superior ventilation. In the judgment of his doctor and the University of Michigan Medical School, Richard Mueller died as a result of using Borden's Krylon Fixative and a Krylon Crystal Clear solvent, and accordingly the widow received workmen's compensation.

In talking with artists about their health problems, it becomes clear that on the national level the medical profession is only now becoming aware that illness incurred by artists may often be related to their materials and work habits. Throughout history, artists have suffered from a variety of stereotypes, including those who typify them as being chronically moody or depressed, emotionally unstable or neurotic, and hypocondriacs.

In our day many doctors have at times been susceptible to these stereotypes. Artists have told me that frequently when they tell their physician of prolonged periods of depression and fatigue, they are automatically given mood elevating drugs. In many, if not most cases, the artist's symptoms of illness are treated, but the causes are not sought.

While no government action can eliminate the stereotypes that may hinder proper medical diagnosis of artists' problems, truth in labeling of artists' materials can be of incalculable benefit both to the artists and their physicians in determining whether or not these problems are occupationally related.

I would like to point out to this committee that many if not all artists cannot belong to group medical plans, and cannot afford sophisticated or even proper medical care.

Perhaps one in a hundred artists can support himself and his family entirely by working as an artist. The rest must augment what little they earn as artists by other jobs. Many artists, for example, are only part-time teachers, and do not have eligibility for their schools' group medical plans. Few artists can afford the

$100 a month it costs in my State, California, to belong to Blue Cross, not when studio rentals are soaring and their normal cost of living so taxes limited means.

In such instances artists tend to be lax about obtaining proper medical treatment when they begin to feel ill. The treatment they may obtain is often from terribly overworked physicians who do not have the equipment, awareness, time, and labeling information to connect the patient's illness with his or her occupation.

Often, as in the case of Inez Storer, the taxpayer has had to pay the severe medical costs of artists and their children, or workman's compensation, as in the Richard Mueller case. It is thus in the interest of physicians and taxpayers as well as artists that H.R. 6977 be passed into law.

Artists who teach tell me that students of all ages take more seriously and better remember warnings of health hazards that are printed rather than given to them verbally by their teachers. There is something about seeing in black and white a manufacturer's statement that a certain product is poisonous that is more credible and an inducement to caution for students than a teacher saying the same thing.

The view that artists roll up their tubes of paint thus hiding the label is based on another stereotype that folds when one visits studios. Artists and teachers of art tell me that art suppliers should also print on their display stands in the art supply sections of stores warnings about toxicity.

You asked me what my assessment is of this bill. Obtaining unanimity of opinion of artists in favor of something is even more difficult than among Congressmen. In my 30 years in the profession, this is the only time I have found artists totally united in support of a proposal. All artists want to be free of medical fear in practicing their profession, and women artists want to protect their unborn children.

H.R. 6977 is the logical next step in extending to artists and those millions who use artists' materials the right presently enjoyed by certain other consumers. Artists deserve the right to know about the dangers of their materials as part of their right to live and work.

While it may be in the self-interest of certain art supply manufacturers to withhold information that if divulged might curtail profits, this concern is neither in the best interests of artists or the American public, which is the ultimate beneficiary of art. Privately and by means of local, State, and the Federal Government, we are making important strides in preserving works of art. It is time we took the legislative step of helping to save the lives of countless artists.

Thank you.

[Testimony resumes on p. 169.]

[Dr. Elsen's prepared statement follows:]

STATEMENT OF DR. ALBERT E. ELSEN, PRESIDENT, COLLEGE ART ASSOCIATION

I testify on behalf of H.R. 6977 because two years ago I introduced Congressman Fred Richmond to the subject of occupational health hazards among artists and urged him t undertake the research that could lead to new legislation. My own involvment with this subject did not come about directly because of my occupation, which is that of a teacher of art history at Stanford University where I hold the Walter A. Haas Chair in that subject. In 1974 I became President of the College Art Association of America, which is the national organization of approximately 6,500 art historians and artists who teach. One of the CAA's functions is to establish national standards for the professions it represents. Responding to the requests of the CAA's artist constituency, I chaired an open forum at our annual meeting held that January in Detroit. The subject was artists' health hazards. The turnout of several hundred was one of the largest ever held for an artists' session. For three hours individual artists and representatives of various artists' groups spoke of the seriousness and alarming extent of occupationally induced illness. (Dr. Michael McCann was a panel member and he spoke about the problems from his expertise, which I am sure is now known to this Subcommittee.) At the end of the Detroit forum it was clear that the CAA should take action. I asked our then Vice-Preside George Sadek, Dean of Art at Cooper Union, to take on the responsibility of coordinating the CAA's involvment with this national problem. It was Dean Sadek's idea to produce the valuable manual, Safe Practices in the Arts and Crafts: A Studio Guide, published by the CAA in 1978, a copy of which I am sure this Subcommittee has as part of the hearings' record.

Part of my purpose in testifying is to inform this Subcommittee of what might be called the matching effort of artists in meeting the problem of alerting the profession to health hazards, rather than their simply relying upon government assistance. Specifically, I would like to point to the fact that the first article of the Code of Ethics for Artists adopted by the CAA in 1977, requires that artists who teach must instruct their students in the safe use of materials and equipment. The preamble and resolution read:

"In recent years the profession has become tragically aware of the dangers posed to artists by their equipment and materials. The previous absence of limited accessibility of information on health perils meant that many artists who taught as well as students, worked in ignorance of these dangers. Whether or not the artist avails himself or herself of the information available concerning health risks is a matter of individual choice. Ethically, however, the CAA does not feel such a choice exists for teachers of art students.

"Resolution: A teacher of art is ethically obligated to study and learn as part of his/her professional competence and preparation all relevant information available concerning proper health and safety procedures in the use of equipment and materials of his or her discipline. A teacher of Art is ethically obligated to teach, maintain and enforce the highest professional standards of health and safety in the use of equipment and materials employed in the course."

The previously cited CAA publication and article of the Artists' Code of Ethics confirms that in the judgment of a national organization the problem of artists' occupationally related health hazards is universal and therefor exists wherever artists and art students work. The growing number of information centers and courses on safe practices in art testifies to the increasing awareness that artists have of the fact that the practice of art is not just a matter of life, but also of death.

As an art historian whose field of special competence is modern art, I am in constant contact with living artists. Unfortunately a number of them have experienced occupationally related illness. Almost without exception, all artists I know have at one time dropped a certain medium such as lead based paints or polyester resins, Magna color, or different types of solvents and fixitives or glazes out of fear for their health. Artists who knew and visited the late Morris Louis here in his Washington studio are convinced that his premature death was caused not just by smoking, but the ferociously odiferous special medium he was using. The painters Joan Brown and Tom Holland both knew and worked with the late painter David Park, and they recall how traces of white lead paint could be seen on his lips as he smoked. The sculptor Duane Hanson recently told me that his cancer of the lymph nodes came about while he was working with polyesters, the same material used by boat builders. Joan Brown, who is an art professor at UC Berkeley, experienced severe dermatological problems as a consequence of a reaction either to her oil based paints and or the paint thinner she used. Her dermatologist, a Dr. Mc Ginley, who now heads the Department of Dermatology at Kaiser Hospital in San Francisco, believed that her problems were due to the cumulative effects of exposure to

these materials. Then she began to use surgical gloves the problems stopped. The painter Jay de Feo worked for six years on one large oil painting that weighs 1,000 pounds and is called "The Rose." She used black and white lead based paints. She told me that she experienced severe gum problems and eventual loss of almost all her teeth while working on this painting. Her dentist could see no reason why a young person should experience these difficulties. Joan had thought it took a lifetime's exposure to leaded paints to become seriously ill. When she finally switched to acrylics her condition stabilized. One of the most tragic stories known to me is that of the artist Inez Storer now teaching at UC Davis. When she was younger she painted with toxic materials. During that time she had two spontaneous abortions, but delivered four children all born with birth defects. All had club feet and separation of their teeth. One had hip displasia. The second a cruvature of the spine. The third had a cleft palate. The fourth had a severe deformation of the jaw. Due to the then poverty of Inez and her law student husband, medical care was paid for by the Babcock Foundation and Marin County. Her doctors do not see any genetic cause in the parents for the childrens' deformities. There is no more ardent advocate of H.R. 6977 than Inez Storer. One of the most recent cases brought to my attention by his lawyer is that of a Detroit designer who died in 1976. He worked for an architectural firm doing pastel renderings in a new, prize-winning building that had superior ventiliation. In the judgment of his doctor and the University of Michigan Medical School, Richard Mueller died as a result of using Borden's Krylon Fixitive/ and a Krylon Crystal Clear solvent, and accordingly the widow received Workman's Compensation.

In talking with artists about their health problems it becomes clear that on the national level the medical profession is only now becoming aware that illness incurred by artists may often be related to their materials and work habits. Throughout history artists have suffered from a variety of stereotypes, including those which typify them as being chronically moody or depressed, emotionally unstable or neurotic, and hypochondriacs. In our own time many doctors have at times been susceptible to these stereotypes. Artists have told me that frequently when they tell their physician of prolonged periods of depression and fatigue, they are automatically given mood elevating drugs.

In many, if not most cases, the artist's symptoms of illness are treated but the causes are not sought. While no government action can eliminate the stereotypes that may hinder proper medical diagnosis of artists with health problems, truth in labelling of artists' materials can be of incalculable benefit both to the artists and their physicians in determining whether or not these problems are occupationally related.

I stress that our government is being asked by Congressman Richmond not to miraculously solve this tragic problem, but to contribute to artists' ability to help themselves. Many if not most artists cannot belong to group medical plans and cannot afford sophisticated or even proper medical care. Perhaps one in a hundred artists can support himself and his family entirely by working as an artist. The rest must augment what little they earn as artists by other jobs. Many artists, for example, are only part time teachers and do not have eligibility for their school's group medical plans. Few artists can afford the $100 a month it costs in my state to belong to Blue Cross, not when studio rentals are soaring and their normal cost of living so taxes limited means. In such instances artists tend to be lax about obtaining proper medical treatment when they begin to feel ill. The treatment they may obtain is often from terribly overworked physicians who do not have the awarenes, time and/information to connect the patient's illness with his or her occupation. Often, as in the case of Inez Storer, the tax payer has had to pay the severe medical costs of artists and their children, or workman's compensation as in the Richard Mueller case. It is thus in the interest of physicians and tax payers as well as artists that HR 6977 be passed into law.

labelling

Artists who teach tell me that students of all ages take more seriously and better remember warnings of health hazards that are printed rather than given to them verbally. There is something about seeing in black and white a manufacturer's statement that a certain product is poisonous that is more credible and an inducement to caution than a teacher saying the same thing. The view that artists roll up their tubes of paint thus hiding the label is based on another stereotype that folds when one visits studios. Artists and teachers of art tell me that art suppliers should also print on their display stands in the art supply sections of stores warnings about toxicity.

Obtaining unanimity of opinion among artists in favor of something is even more difficult than among Congressmen. In my thirty years in the profession this is the only time I have found artists totally united in support of a proposal. All artists want to be free of/medical fear in practicing their profession, and women artists want to protect their unborn children. HR 6977 is the logical next step in extending to artists and those millions who use artists' materials the right presently enjoyed by certain other consumers. Artists deserve the right to know about the dangers of their materials as part of their right to live and work. While it may be in the self-interest of certain art supply manufacturers to withhold information that if divulged might curtail profits, this concern is neither in the best interests of artists or the American public which is the ultimate beneficiary of art. Privately and by means of local, state and the federal government we are making important strides in preserving works of art. It is time we took the legislative step of helping to save the lives of countless artists.

Albert E. Elsen

How artists named in this testimony may be contacted:

Inez Storer, P.O.Box 485, Inverness California [redacted]
Duane Hanson, 6109 Southwest 55 Court, Davie Florida [redacted]
Joan Brown, [redacted]
Jay de Feo 29 Millard Road, Larkspur Ca. [redacted]
The lawyer for the late Richard Mueller, William Goodman, 3200 Cadillac Tower, Detroit Michigan 313-965-0050
Tom Holland [redacted]

Mr. LUKEN. Thank you very much, Dr. Elsen.

Mr. Richmond, do you have comments or questions?

Mr. RICHMOND. Thank you, Mr. Chairman.

Ms. Levy, your testimony was most interesting, but in your work, do you have many examples of artists who you know of who became ill from the products they use?

Ms. LEVY. Yes. I also would like to recount my own experience that I had. Many years ago, when I was in college, I was industriously working on a silk screen in my dorm room. I was working on it for quite a long period of time. Some friends happened by, and walked into the room, and basically they threw me out the window. They threw me out the window, because as they walked into the room, they saw the vapors from the lacquer solvents rising off of my body, and felt that since there wasn't any ventilation in the room when they walked in, that I might be better off by being given some ventilation.

That was long enough ago so that I learned to be more cautious.

I also have a story of a friend who was a stained glass artist, who was working 16 hours a day on his stained glass, and began after a while to feel numbness in his feet, very tired, run down, at some point couldn't open and close his hands. It was at that point that he decided it was no longer the flu that was attacking him.

He went to his family physician. He had a family physician who was very wise. He gave him a lead test, and it was found that he had lead poisoning. He now uses himself as his best example for his students, and certainly gets the message across to his students.

Mr. RICHMOND. Dr. Elsen, I want to personally thank you for bringing this terrible problem to my attention. I certainly owe you a great debt of gratitude.

Dr. ELSEN. May I be excused? I have a plane to catch.

Mr. LUKEN. We are going to excuse the panel right now, because we have to vote anyway. So, thank you very much, all of you, for an excellent presentation.

We will take up the second panel when we return in about 5 minutes.

[Brief recess.]

Mr. LUKEN. All right, we are about to reconvene, if the panel of industry representatives will gather around the table.

All right. Is everyone here? Is Dr. Goldwater here? Mr. Landstrom is here, in the center. Mr. Vukovich, and Mr. Johnson.

Do you want to proceed in that order?

All right. As you begin, we will start with Dr. Goldwater. Would you identify yourself, please?

Before you do, we have your written statement, I believe. [See p. 174.] It will be received into the record as is. You may summarize it or testify from it or any way you think will be helpful to us. Dr. Goldwater?

STATEMENTS OF LEONARD GOLDWATER, M.D., TOXICOLOGY CONSULTANT, CRAYON, WATERCOLOR & CRAFT INSTITUTE; HOWARD L. LANDSTROM, EXECUTIVE DIRECTOR, NATIONAL ART MATERIALS TRADE ASSOCIATION; MILAN VUKOVICH, JR., ON BEHALF OF NATIONAL CERAMIC MANUFACTURES ASSOCIATION; AND FREDERICK F. JOHNSON, MANAGER, PRODUCT SAFETY TASK FORCE, NATIONAL PAINT & COATINGS ASSOCIATIONS, ACCOMPANIED BY HUGH F. YOUNG, JR., LEGISLATIVE COUNSEL; AND PATRICK J. HURD, INDUSTRIAL HYGIENIST

Dr. GOLDWATER. Thank you, sir.

I am happy to be seated here with the panel labeled industry panel. I should prefer, however, to identify myself as an individual who has had considerable experience in various aspects of toxicology, occupational diseases, labeling, and evaluation of hazards of art materials.

I hope I will be pardoned if I spend a little time on these qualifications, because I have probably had more experience in this particular thing than almost anybody alive today, I might say, really, literally, because I am of somewhat advanced age. My experience is of at least 45 years.

During the past 45 years, I have had specialized training not only in internal medicine, and am certified as a specialist in that field, but also in occupational medicine. I have occupied senior faculty positions in several universities. I have served as consultant for international, national, and local agencies in great number, also for trade unions and industries.

I have published at least 150 articles in referred scientific journals. I have written a book, and chapters for many leading reference textbooks.

I noticed that in Ms. Barazani's presentation she cited as one of the authorities she used a book edited by SATS called Dangerous Properties of Industrial Materials. The material in that book was written by me. I prepared all the toxicology for three editions of that book, and also for several other standard, widely used reference texts.

So, many of the things that I saw or heard, it seemed to me a case of déja vu. I had seen or heard it before.

I say these things because, although as I say in my written statement, I am definitely in favor of this legislation, at least in its objectives and its basic thrust. But I should like to point out some of the pitfalls which seem to me may not yet have been adequately realized.

For example, and I cite these things not necessarily in order of importance, is the question of diagnosis. This is so terribly important to me. It is important to every patient. It is important to every action that everybody takes in anything having to do with medicine or poisoning involving humans or, for that matter, nonhuman animals. I am concerned with those, too.

I don't doubt that there have been a number of cases—I don't know how many; nobody knows how many cases there have been of individuals exposed to various artists' materials who have been made sick by them. But the danger is that if one assumes, and it seems to have been done here, that because somebody has used

something, and following that usage somebody became sick, it necessarily follows that the sickness came from the use.

This we call post hoc ergo propter hoc reasoning, which is very dangerous, and I can underline this by saying that I have seen quite a number of patients over these 45 years where someone has decided because there was an exposure the illness present was the result of that exposure.

All too frequently this results in overlooking some other important medical conditions, and just within the past few weeks, for example, I saw a woman who had worked in a plant with exposure to mercury. She had a number of complaints. She was losing weight. She was feeling weak. She was nervous. She was tired. And so on.

Somebody said, "Oh, you work with mercury. This must be mercury poisoning." Well, unfortunately, she had advanced cancer, but nobody was looking for cancer, and for months she was being treated or being diagnosed as mercury poisoning. All this time, nothing was being done about her cancer.

I could repeat that sort of story over and over again. So that is why I say, it is dangerous to assume that there is a cause and effect relationship, without considering other possibilities.

Now, I think that again, unfortunately, as has been brought out here, we in the medical profession and those of us associated with teaching medical students have not been very successful in getting this message of the environmental exposures, of the toxicological problems, the industrial medical problems to our medical students.

I have been asked, well, why is this so? My answer is quite a simple one. It is a question of turf, that if you are on a medical faculty and want to introduce something new, that means somebody else has got to give up something that they already have, and I suspect that medical professors and teachers are no more flexible in this respect than a lot of other people. They are not going to give up any of their time.

So, it is very difficult to get this into the curriculum. I can say, however, on a favorable note, that within the past few years, with all of the attention that is now being given to environmental health and occupational health, at long last there are students who on their own come and say, can't we have something more in this field? And we are certainly more than happy to give it to them. We receive them enthusiastically and with open arms, and we cherish them.

For 40 years I struggled to try to find students who would be turned on by this sort of thing, with very, very questionable success. Now we perhaps are making some progress, and the newer generations may come out a little better prepared than those of the past. I am ashamed of the failures of medicine in this respect.

Another hopeful sign is that the people being trained in family medicine who have a broad outlook also are showing interest in this, and we are trying to snare a few of them and get them oriented toward the kind of work that is involved in toxic exposures to various chemicals.

Another thing that I have in my written statement is a little discussion about definitions and terminology. In there, I call attention particularly to the definition of the term "toxic." This to me is

the big troublemaker all down the line, not only in this proposed legislation, but in many other bills and laws that have been passed by other committees and enforced by various agencies.

A definition is given in there that something is toxic if it can cause bodily harm. Obviously, this is an absurd definition. If a piece of roof falls down and hits me on the head, this has caused me bodily harm, but it is not toxic in the ordinary sense. That, of course, is an extreme example, but it is not too extreme, because, as has been pointed out over and over again, if you take a couple of ounces of ordinary table salt and eat it, you will probably die. Now, is table salt a toxic substance? Of course not, in the ordinary sense.

So, I am nervous about these loose definitions and the loose use of these terms. I think this has caused a great deal of trouble. What is necessary, of course, is to specify amounts of things, and it is the amount of something that is important, not the thing itself. Anything can be toxic, absolutely anything, and I think that as I suggest in my statement, if consideration is being given to some amendments or changes in the basic Hazardous Substances Act, that this might be a very good time to examine these definitions and see what they are doing and perhaps how they can be improved or made more in accord with what would be acceptable in the scientific community. I think this is extremely important.

There are many other things I could say. Maybe I have said enough already, but one of the things, of course, which has caused problems in the art field is this drastic change in the things artists do. It is no longer a piece of canvas and a few tubes of paint.

Is this microphone working?

Mr. LUKEN. No, but you don't need it.

Dr. GOLDWATER. My wife always says, you are lecturing, take it easy. Well, I am a little bit used to lecturing, and of course I enjoy having a captive audience. You can see that I am really having a good time up here. When you have had enough, just give an appropriate signal, and I will quit, and we can adjourn to the hallway or something. I believe that there should be more information on labels. There is no question in my mind about this, but again, some of these products may have 20 or 30 different ingredients. Some of them may have chemical names that would take four lines to write.

I will give you a few simple examples here. What if I tell you that this contains diamino azo benzene? Is that going to tell you anything? And more than that your potato chips contain butylated hydroxytoluene? You are assuming that FDA has said butylated hydroxytoluene is OK. Maybe it is and maybe it isn't, but I think this is something that must be considered, what kind of information you give and what use will be made of this information.

Now, I think it is important that again, as somebody suggested earlier, someone who is working with a material and is not sure whether or not it is safe goes to a doctor, and assumes quite correctly the doctor may be quite unfamiliar with the material. It would be helpful to remind the doctor that perhaps this is something that may have had something to do with the illness. This advice on a label or in a package stuffer I think would be very helpful, because doctors just don't ordinarily think of these things.

There are a number of similar points. Perhaps I don't need to belabor them all, but again, what is a poison?

Some of you may have seen this advertisement in Time magazine a couple of weeks ago. It is an ad by a prominent chemical company. It has a picture of an orange and a list of ingredients in this orange. Now, there are probably several hundred ingredients in this orange. Some are illegible, but some are not. Those that you can read are a few like this, zanthene, barium, boron, chromium, copper, manganese, lead, nickel, tin, strontium, silver, titanium, vanadium, zinc, and so on, and so on, and so on.

I daresay there is arsenic in there, too.

Now, is this orange poison? Of course not. It is a question of how much is in there. So, I think you want to remember this, too, when you are talking about things: What is dangerous and toxic? Think of how much.

Along those lines, I will just say one more thing, that sometimes we lose sight of our basic objectives. The objective here is not to have a lot of labels on things. It seems to me the objective is to protect the health of the user. So, what I think you would want is a label that will accomplish that purpose, and you put on the label exactly the amount that will do that, no more and no less.

I think that if you do that, everybody should be very happy, and I think the artists will be very safe.

Thank you.

[Testimony resumes on p. 181.]

[Dr. Goldwater's prepared statement follows:]

70-237 O - 81 - 12

H.R. 6977

Statement of Leonard J. Goldwater, M.D.

My name is Leonard J. Goldwater, M.D., and my address is Route 3, Box 197, Chapel Hill, N. C. 27514. I am Professor Emeritus of Occupational Medicine at Columbia University, Adjunct Professor at the University of North Carolina in Chapel Hill and Consultant in Occupational Medicine at Duke University in Durham, N. C. For more than forty years I have been engaged in research, teaching and practice of occupational and environmental medicine. I have published about 150 articles on various aspects of occupational medicine and have written chapters on toxicology for several leading reference works. I have served as consultant to the World Health Organization, the International Labor Office, several agencies of the U. S. government and to state and local bodies. I have also been a consultant to several labor unions and industries.

Of immediate relevance to my appearance at these hearings is the fact that from 1957 until July 1980 I served as consultant in Toxicology to the Crayon, Water Color and Craft Institute, a trade association made up of some of the leading manufacturers of art materials, particularly those used by children. My principal responsibility was to review all formulations and packaging with a view to excluding any ingredient and product that in my opinion could constitute a threat to health, even if eaten. As an example of the type of opinion I express in regard to children's art materials, I may quote from the American National Standard for School Wax Crayons (ANSI Z356.1-1980): "No material used in the crayons shall be present in sufficient quantities to be toxic or injurious to the human body as a result of any foreseeable handling or use, including ingestion of a large single dose such as an entire package of eight crayons or forty grams, or multiple small doses (for example,

from biting to sharpen) comprising the equivalent of one gram daily indefinitely". I should like particularly to call attention to the inclusion of quantitative factors which are essential in any definition of toxicity. Over the years there have come to my attention a small number of instances in which one of these products has been suspected of causing an adverse effect. The number of such cases has amounted to no more than one or two a year and in practically all, the suspected effect has been of an allergic nature. I have not become aware of a single case of even mild systemic poisoning from use or abuse of a product for which I had given approval.

Although my consulting practice has been fairly extensive, I cannot recall having seen a single case in which an artist had been poisoned by materials used in this occupation, but I have read of such cases and do not doubt that they have occurred. In view of the millions of persons handling a great variety of artists' materials I believe that toxic reactions must be relatively infrequent. This is not to say that some of the materials do not present a threat to health. I have seen cases of poisoning from some of the chemicals that enter into formulations used by artists and might mention lead and benzene as examples, but the exposures with which I have dealt have been exclusively in industrial settings in which precautionary measures have not been observed.

I am aware that in recent years there have been drastic departures from the traditional materials and modalities used in the art world. About twenty years ago I wrote an article which was published in a magazine read by artists calling attention to the health hazards which could result from careless handling of materials then coming into common use.

I support the objectives of H.R. 6977. If it is reasonable to warn consumers of acute hazards (and I think it is) it is no less reasonable to warn of chronic effects.

Some type of identification of the nature of consumer products, including artists materials, is, in my opinion, desirable. This applies particularly

to products which contain chemicals with which the user may not be familiar. I recall my experiences in the 1930's when I was employed by the Division of Industrial Hygiene of the New York State Department of Labor. My job was to investigate cases of suspected occupational poisoning. Time after time I would encounter drums or other containers of chemicals which carried no label at all or labels giving proprietary names but no indication of the identity of the contents. The absence of suitable labeling and of a warning about possible adverse health effects was, to say the least, most unfortunate. Even when many leading manufacturers of industrial chemicals voluntarily initiated a program of warning labels, these appeared only on the original containers (tank cars or drums) and were not carried over to smaller containers used on the factory floor. This suggests that in art schools or other places where materials are portioned out for use, information on possible hazards should be carried to the point where the actual user is forewarned.

Along with my general approval of the objectives of H.R. 6977 I should like to take the liberty of offering some suggestions as to how the Hazardous Substances Act and hence the amendments might be strengthened. My principal criticism is loose use of terms and the indiscriminate application of labeling requirements.

While, as I have said, I believe it is equally important to warn the user of possible chronic as well as acute effects, there are certain differences which should be considered. In acute heavy exposures, immediate or very prompt action is necessary to prevent death or serious non-fatal effects. There may not be time to secure medical attention and therefore first aid measures should be known. Chronic effects, by their very nature, tend to be slow-acting and insidious. It is often difficult to distinguish between these effects and those due to a non-related disease process. Self diagnosis or

reliance on untrained persons can be dangerous and should be avoided. Although there has been some progress in recent years, the traditional training of physicians has not included very much attention to poisonings. Most physicians are ill-prepared to evaluate suspected poisoning and may not think of this as a possible diagnosis. It might also be useful to remind users and their physicians that they can obtain guidance from local Poison Control Centers. I suggest, therefore, that any warning affixed to potentially harmful chemicals advise the user who experiences untoward symptoms be sure to inform his or her physician about chemicals used, thus calling attention to a possible explanation of the symptoms. This would be analogous to the standard instruction when dealing with acute exposures to "Call a physician". Such information might be more helpful than noting on a package that the contents contain dimethyl aminoazobenzene or trihexaleneglycol monobutyl ether, for example. Such compounds as these may or may not be any more dangerous than butylated hydroxytoluene which is present as an additive in potato chips.

I trust that I am not alone in deploring the frequency with which legislation such as that embodied in H.R. 6977 is met with legal challenges and interminable litigation. I have given a great deal of thought as to why this happens and to possible means whereby it might be avoided or at least mitigated. I choose to believe that the difficulty does not arise from the intransigence of bureaucrats, the unscrupulousness of industry or the incompetence of scientists. I believe that at least some of the trouble originates in the definitions which have been incorporated in this and other legislation.

Most troublesome is an understanding of what is meant by the term "toxic". Quoting the Federal Hazardous Substances Act, "The term 'toxic' shall apply to any substance (other than a radioactive substance) which has the capacity

to produce personal injury or illness to man through ingestion, inhalation, or absorption through any body surface." As has often been pointed out, according to this definition such things as oxygen, water and table salt would be "toxic" since in excessive quantities they could be lethal. The Act covers substances which are "toxic" provided they "...may cause substantial personal injury or substantial illness during or as a proximate result of any customary or reasonably foreseeable handling or use, including the foreseeable ingestion by children." It seems to me that these qualifications constitute an invitation to disagreement and dispute. What is "substantial"? What is "proximate"? What is "customary"? What is "reasonably foreseeable"? It may be customary, for example, for artists to work in cramped quarters and to eat without washing their hands. What is substantial to one person could be negligible to another. There could be great differences in opinion as to what is reasonably foreseeable. Does proximate apply to a time period or to an uninterrupted sequence of events?

The Act properly defines "highly toxic" by specifying doses which have certain effects. This quantitative feature is an essential part of any consideration of what is "toxic" or "non-toxic". Thus a hazardous substance could be defined as one which contains a sufficient amount or a sufficiently high concentration of a chemical to cause bodily harm. For example, acetic acid in the glacial form (99.5% concentration) is extremely hazardous, but as vinegar (5% concentration) it obviously is not. Iodine can cause serious burns, but without iodine human life could not be maintained. There are innumerable examples of this sort, and I believe that failure to take this quantitative concept into account has led to a great deal of disagreement and dispute. Since amendments to the Hazardous Substances Act are now under

consideration, this might be an appropriate time to eliminate some of its weaknesses by revising some of the definitions.

The Act applies to substances which may cause personal injury, implying effects on humans, yet actions are to be dictated based on effects on experimental animals. Critics might find this inconsistent. We should not forget that the Hazardous Substances Act provides that "If the Secretary finds that available data on human experience with any substance indicate results different from those obtained on animals in the above-named dosages or concentrations, the human data shall take precedence."

The requirement for labeling any product which has been found to cause tumors in experimental animals with the words WARNING: HAS BEEN SHOWN TO CAUSE CANCER IN ANIMALS, if carried to its logical conclusion would call for the labeling of every container of milk since milk contains lactose which has been found to cause cancer in animals. The same applies to maltose in beer and many other substances. Inclusion of tests on micro-organisms, presumably the Ames test, as evidence for carcinogenic properties could lead both to under- and over-labeling.

We are all aware that as far as the general public is concerned there has been a certain amount of apprehension, confusion and even scorn at what may appear to some as indiscriminate labeling of so many things as toxic or carcinogenic. This suggests to me that the present labeling proposals would have maximum effectiveness if they are somewhat selective. If everything that could possibly cause harm carries a cautionary label, there might be a tendency to ignore the entire lot as is done in the case of cigarettes and saccharin. On the other hand, there are certainly a number of chemicals which constitute causes for concern, calling for appropriate warning and informational labeling. I believe it would be possible and desirable to compile suitable lists, perhaps

assigning grades or degrees of hazard to be keyed to corresponding warnings. This system of graded warnings is nothing new.

Finally, I should like to enter a mild protest at a blanket condemnation of the art materials industry as being "unwilling to regulate itself". This may apply to some, but it does not apply to all segments of the industry. For nearly fifty years the Crayon, Water Color and Craft Institute, representing a number of leading manufacturers of children's art materials, has maintained a program to assure that hazardous products were not sold. As a result of questions raised at hearings before the Federal Trade Commission last year, steps are being taken to strengthen what has always been an effective, and widely recognized program.

It is my personal conviction that governmental intervention is not necessarily the most effective means to desirable ends. Perhaps with a little nudging and some constructive planning, including a statement of goals, voluntary self-regulation could find wider application in the entire arts materials industry.

In closing, I should like to thank Congressman Scheuer and Congressman Richmond for being invited to testify. Because of my interest in consumer protection in general and in the matter of artists' materials in particular, I am prepared to volunteer my services in working with their staffs in shaping the most effective wording for this important legislation.

September 17, 1980

Mr. LUKEN. Thank you very much, Dr. Goldwater. We are glad you didn't need the aid of the microphone, and that you are accustomed to lecturing, but we are accustomed to listening. It was very well presented. I think somebody said one time, if I had a voice as good as yours, I feel about this like a stud bull feels about artificial insemination, quite unnecessary. Mr. Landstrom?

I don't think any of the microphones are working. If you will just do the best you can. Otherwise, we may go through a long repair process. None of us wants to wait around here for that.

Your written statement will be included in the record.

STATEMENT OF HOWARD L. LANDSTROM

Mr. LANDSTROM. Mr. Chairman, I am pleased to have the opportunity to be a member of this industry panel and to present my views on the proposed H.R. 6977.

I am not a chemist, a scientist, a doctor, or an attorney. I have been a certified association executive in the National Art Materials Trade Association for the past 8 years, and have worked in the art materials industry for the past 27 years.

The scope of the artist's materials is a very diversified industry, covering such categories as fine arts, commercial/graphic arts, drawing, drafting and engineering supplies, sculpturing and ceramics, screen printing, crafts and hobbies, school supplies, framing, et cetera.

However, for each of these categories there is a trade association that represents the different segments of the art materials industry.

Our manufacturer members are well aware of the Federal Hazardous Substances Act and proper product labeling. Many are labeling their products with warning and caution labels as well as the first aid treatment.

I have several packages here I would like to have included in the report.[1] This is Columbia artists rubber cement, with a warning on here, with a skull and crossbones, also that it is inflammable. It is both in French and in English. The caution is listed as well as the first aid treatment.

Here is a tube of cadmium red light, which also has the caution, the proper caution on here as well as the ingredients listed of the materials that are in this, too.

There are several others. I have labels from many of our manufacturers with their caution plus their first aid treatments that are listed, and I would like to have this also included in the record.

A gentleman before showed an excellent printed piece from the screen process products of a company that does very well, and I believe that we are not in the screen printing area as much as another association is. However, they do an excellent job of notifying the end user of these products on how to use them, and the cautionary and warnings that have to be taken in using them.

From our last executive conference that we had, the Manufacturers' Executive Conference we had in March of 1979, Congressman Richmond did speak to us. He made us very aware of the legislation that would be coming in due course. Many of our manufacturers have listened to his presentation, and have gone ahead and

[1] The packages referred to may be found in the subcommittee's files.

made many numerous changes. Maybe some of the changes that Congressman Richmond showed this afternoon on the table—as I looked at some of the products, most of them are very old and have been replaced.

This one here is on airbrushing, and they do have an informational sheet, very extensive. Ventilation using respirators. The resources even for children, because they do have student airbrushes. I would like to also submit this for the record.

Mr. LUKEN. The real chairman has arrived, and I did neglect to say in turning the gavel over to the chairman, the two exhibits that you have just mentioned will be, without objection, received.

[The materials referred to follow:]

AREA CODE 312 678-3104

BADGER AIR-BRUSH CO.
9128 W. BELMONT AVE., FRANKLIN PARK, ILL. 60131
Cable Address: BADGERAIRCO, Franklin Park, Il. 60131 (U.S.A.)

PLEASE READ CAREFULLY BEFORE USING YOUR BADGER AIR-BRUSH

Your new BADGER Air Brush should provide you with many hours of enjoyment. However, because of the nature of air-brushing and of the composition of materials which you may use in your air brush, we have printed this sheet to provide you with information about potential hazards.

Many materials commonly used in arts and crafts projects (such as lacquers, varnishes, adhesives, fixatives, powders, acrylics and solvents) can be extremely hazardous. Not all of these materials will be used in your Air Brush, but may be used in some other phase of your project. We recommend that you always find out what is in the material you use. We suggest that when using any chemical substance that you request a copy of the manufacturer's Material Safety Data Sheet from your art supply dealer. This will give you some indication of the dangers posed and some of the precautions you need to take.

ALWAYS READ AND FOLLOW LABEL DIRECTIONS CAREFULLY.

CHILDREN

Hazardous materials pose an even greater risk to children due to their lesser body weight and frequent lack of care in following directions. CHILDREN SHOULD ALWAYS BE SUPERVISED WHEN USING AN AIR BRUSH OR ART MATERIALS (unless the materials have been certified by the Crayon, Watercolor and Craft Institute). An air brush is not a toy. It should not be pointed at anyone or at oneself.

GOOD HYGIENE IS IMPORTANT ANYTIME YOU ARE WORKING WITH ART MATERIALS

- Do not smoke, eat or drink while air brushing.
- Avoid putting your fingers in your mouth while working on art projects.
- Be sure to clean your fingernails and wash your hands when you are finished.
- Be especially careful of the materials you use if you have cuts or open sores.
- STOP WORK AT THE FIRST SIGN OF DIZZINESS, NAUSEA, HEADACHE, BLURRED VISION, OR SKIN IRRITATION. Seek fresh air immediately, and call a doctor if the symptoms persist or are severe.

MEMBER

VENTILATION

An open window does not provide adequate ventilation when working with hazardous art materials. When working with these materials, you should have an exhaust ventilation system (one which removes vapors, dusts, etc., from the area in which you are working and vents to the outside). A general ventilating system dilutes toxic vapors with fresh air to lower their concentration to a safer level.

Many factors have to be considered to determine the kind of ventilating system you should have. We suggest that you contact the National Institute for Occupational Safety & Health (NIOSH); Robert A. Taft Laboratories, 4676 Columbia Parkway, Cincinnati, Ohio 45226 for publications which they have dealing with ventilating systems.

RESPIRATORS

A respirator may pose more of a hazard than a help unless:

- you get one designed to filter out the specific hazardous substance you are working with
- one that fits properly
- you keep it properly cleaned and maintained.

We suggest you buy only a NOISH approved respirator and read and follow carefully the instructions which come with it.

A respirator may not be suitable for some people with heart or breathing problems. Information on respirators is also available from NIOSH at the address above.

RESOURCES

In addition to NOISH, you might want to read Health Hazards Manual for Artists by Michael McCann, PhD (published by the Foundation for the Community of Artists, 280 Broadway, Suite 412, New York, New York 10007) or contact the Consumer Products Safety Commission, Washington, D.C. 20207.

CAUTION • DANGER
COMBUSTIBLE

KEEP TIGHTLY CLOSED

Contains Turpentine. Harmful or fatal if swallowed. Keep from heat and flame. Use with adequate ventilation. Avoid breathing of vapor or spray mist and prolonged contact with skin. If swallowed give 1 or 2 glasses of water or milk.

CALL PHYSICIAN
KEEP OUT OF CHILDREN'S REACH

WINSOR & NEWTON
Incorporated
New York, N. Y.

Product of United Kingdom
Bottled in U.S.A.

2½ FLUID OUNCES

WINSOR & NEWTON

Artists

OIL COPAL VARNISH

SEE CAUTION

Genuine Copal dissolved in a Drying Oil and thinned with Turpentine. It is a very elastic and durable varnish, but rather slow in drying.

GRUMBACHER

CAT NO 648

MYSTON

FIXATIVE FOR COMMERCIAL ART
FIXATIF POUR L'ART PUBLICITAIRE

non-glossy . non-brilliant

NET 6 OZ. AVOIR.(170.45 gms.)

CAUTION . ATTENTION!

CONTAINER MAY EXPLODE IF HEATED
CE CONTENANT PEUT EXPLOSER S'IL EST CHAUFFE

MYSTON
non-glossy fixative with special properties.
FOR COMMERCIAL ART USE

Produces a workable surface on pastel, charcoal, pencil, photos, blueprints and aqueous media renderings. Provides a receptive surface for water colors and inks on suitable water repellent materials such as: acetate, glass, metal, foil, etc. Fixes pastel, charcoal, pencil and reproduction proofs. Retains gloss. Crystal clear. Dries rapidly. Odorless when dry. No lingering odor.

DIRECTIONS. Clean the surface. Place work upright. Hold can vertically 1 ft. from surface. Spray using a side-to-side motion. One coat covers but allow 10 minutes for drying between coats.

CAUTION. CONTENTS UNDER PRESSURE. Do not place in hot water or near radiators, stoves or other sources of heat. Do not puncture or incinerate container. Exposure at temperatures over 120°F. Spray only in well-ventilated area. Contains, methylene chloride, isobutyl and isopropyl acetate, toluol, halogenated hydrocarbons and other ingredients. If swallowed, call physician immediately.

Made in U.S.A.
M. GRUMBACHER INC.
NEW YORK, N.Y. 10001

MYSTON
le fixatif non brillant aux propriétés particulières
POUR L'ART PUBLICITAIRE

Permet de travailler par-dessus le pastel, le fusain, le crayon, les enduits aqueux, les photos et photocalques. Rend réceptive à l'aquarelle et aux encres à dessin la surface des matières imperméables telles que l'acétate, le verre, le métal, la feuille métallique. Fixe pastels, fusain et crayons pour la reproduction. Laisse intactes les épreuves brillantes. Liquid cristalin. Sèche rapidement. Inodore quand il est sec. Sans émanation prolongée.

MODE D'EMPLOI. Nettoyer la surface. Mettre l'art debout. Tenir le vaporisateur verticalement à un pied de la surface. Exécuter un mouvement latéral pour vaporiser. Une couche de va-et-vient en vaporisant. Une couche suffit, mais tenir compte de 10 minutes pour le séchage entre chaque application.

ATTENTION! CONTENU SOUS PRESSION. Ne pas mettre dans l'eau chaude ni près des radiateurs, poêles ou autres sources de chaleur. Ne pas percer ou incinérer le contenant. Ne pas jeter au feu ni le conserver à des températures dépassant 120° F. N'utiliser que dans un espace bien aéré. Éviter de respirer les vapeurs. Contient des méthylène-chlorure, acétate d'isobutyle et isopropyl, toluène, des halogènes de hydrochlorures, et des autres ingrédients. En cas d'absorption, appeler immédiatement un médecin.

Canadian Co.
M. GRUMBACHER OF CANADA LTD.
TORONTO 2B, ONTARIO

GRUMBACHER

TUFFILM SPRAY FIXATIVE

Fixative for pastel, charcoal, pencil, photos, blueprints, drawings, etc. Prevents rust. Waterproofs ignition wires, paper, wood, leather, etc.

DIRECTIONS

Clean the surface. Place the work upright. Hold the can vertically about 1 ft. from artwork, 8 in. from other surfaces. Spray using a side-to-side motion. One coat covers, but allow 5 minutes for drying between coats.

CAUTION! CONTENTS UNDER PRESSURE. Do not place in hot water or near radiators, stoves or other sources of heat. Do not puncture or incinerate container or store at temperatures over 120°F. Spray only in well-ventilated area. Avoid breathing spray. Contains xylol, toluol, methylene chloride, halogenated hydrocarbons and acrylic resins. If swallowed, call physician immediately.

Made in U.S.A.
M. GRUMBACHER, INC.
NEW YORK, N.Y. 10001

CAT.NO. 543

TUFFILM
SPRAY FIXATIVE

Fixatif Vaporisateur

FOR CHARCOAL, PASTEL, PENCIL DRAWINGS
Pour les dessins à fusain, à pastel et à crayon

NET 16 OZ. AVOIR. (453.6 gms.)

CAUTION . ATTENTION!

CONTAINER MAY EXPLODE IF HEATED
CE CONTENANT PEUT EXPLOSER S'IL EST CHAUFFE

TUFFILM AEROSOL FIXATIF

Fixatif pour le pastel, le fusain, le crayon, les photos et photocalques, les dessins, etc. Sert d'un antirouille. Rend imperméable à l'eau des matériaux tels que: l'allumage, métal, bois, cuir, papier, etc.

MODE D'EMPLOI

Nettoyer la surface. Mettre les objets debout. Tenir le vaporisateur verticalement. Vaporiser en effectuant un mouvement latéral de va-et-vient à une distance d'un pied de l'art, 8 pouces des autres surfaces. Une couche suffit, mais tenir compte de 5 minutes pour le séchage entre chaque application.

ATTENTION! CONTENU SOUS PRESSION. Ne pas mettre dan l'eau chaude ni près des radiateurs, poêles ou autres sources de chaleur. Ne pas percer le contenant ni le jeter au feu ni le conserver à des températures dépassant 120°F. N'utiliser que dans un espace bien aéré. Éviter de respirer les vapeurs. Contient du xylène, du toluène, du méthylène-chlorure, des halogènes de hydrocharbures et de la résine acrylique. En cas d'absorption-appeler immédiatement un médecin.

Canadian Co.
M. GRUMBACHER of CANADA Ltd.
TORONTO 2B, ONTARIO

Mr. LUKEN. Is that practical, to receive these exhibits and retain them?

Mr. SCHEUER. Surely. I want to thank my colleague for the exemplary job that he did in chairing. It makes me a little bit nervous.

Mr. LANDSTROM. Can I continue, Mr. Real Chairman?

Mr. SCHEUER. Surely.

Mr. LANDSTROM. The consumer advocates are claiming that many of our art material products are toxic and hazardous to a user's health. However, we have not seen any conclusive evidence or reports to substantiate these claims.

I would like to cite an example, cadmium pigments. Our major manufacturers have been aware for some time of the increasing doubts that have been expressed concerning the safe use of cadmium pigments for the coloring of plastics. The knowledge that some cadmium salts are toxic has led to the belief in some quarters that cadmium pigments are also toxic.

First, it can be said that there is no evidence—direct or indirect—of any harm arising from the manufacture or use of cadmium pigments. It makes no sense, therefore, to classify cadmium pigments with other cadmium compounds or alloys for which the risks are clear and case histories offer proof.

Second, in addition to the negative historical evidence, results of two studies offer support that no harm is likely to arise in the future from the use of cadmium pigments and from this it follows that their use should be permitted.

The two studies are from European cadmium pigment manufacturers under the auspices of the Verband der Mineral Farben-Industrie E.V. and the Bayer Institute.

I have other reports stating that cadmium pigments are not toxic from Blythe Colours Ltd., David Heiser, Industrial Scientist S.C.M. Chemical/Metallurgical, Glidden Pigments Groups, E. Loeser and D. Lorke, Institute for Toxicology, Bayer Co., and other consulting chemists, Bodson and Nelis, Liege, Belgium.

I don't believe we need additional legislation and regulations. I do believe however, that enforcement of present legislation and regulations is necessary. Emphasis should be placed on education in the use of artist materials, especially throughout our school systems.

Extensive educational materials are a must. And we heard that testimony yesterday.

Our members share the same goals as everyone present at this hearing.

If any of the art material products are proven hazardous to a user's health, our members will label them with the proper warning and cautions.

We can succeed if we work together in a cooperative spirit with the Government agencies, through communications and exchange of valuable reports.

We will continue to educate our members with the necessary warnings and cautions.

Mr. SCHEUER. Excuse me. How about directions on the safe use of the product, on how to use the product safely? Would that be part of it?

Mr. LANDSTROM. That would be part of it. We are already working on that, on the use of our products.

Mr. SCHEUER. Do the members of the National Art Materials Trade Association label their products with some suggestion as to what the toxic effects might be and how that product should be used so it can be used safely? Are they doing that now?

Mr. LANDSTROM. Not all of them. But we do have some that are doing it now.

Mr. SCHEUER. What do you plan to do about the ones who aren't doing it?

Mr. LANDSTROM. It is a very difficult thing to control, because we don't have every manufacturer of art materials in our trade association. So, it is a very difficult thing to go on the outside and say, hey—let me say this. We do try to notify anyone in our industry on any legislation or regulations where it is necessary.

Mr. SCHEUER. I am talking about the effects of toxicity. We heard some very devastating testimony yesterday on kidney damage, death, all kinds of nervous disorders and what not to come from the use of art materials.

What I am asking you is, Do your members label these products, No. 1, as to the danger of toxic effects, and No. 2, as to how these products may be used, if they can be used safely? That is what we are getting at. You talk about education in a vacuum. What education would mean here is telling the users of your product how they could use the product safely.

Is that being done consistently throughout your industry?

Mr. LANDSTROM. We try, sir.

Mr. SCHEUER. That is not much of an answer.

Mr. LANDSTROM. You just can't——

Mr. SCHEUER. Does your industry want Federal regulation?

Mr. LANDSTROM. Not really.

Mr. SCHEUER. Then why don't they get their act together? Where is this leadership in the free enterprise system? Where is this responsible leadership of industry? If it is there, it seems to me you would have educational materials on these potentially toxic products that instructed people how to use these products.

Where is this leadership? I read Fortune magazine. I am a graduate of the Harvard Business School. I agree that there is very responsible, high quality leadership in American industry. Where is it in your sector of the manufacturing industry?

What you are telling me is, you don't have the leadership there, and that these warnings and these suggestions as to how to use the products safely are not forthcoming, that your trade association doesn't have the clout to get these kinds of instructional materials into the strain of commerce, and that Federal legislation is a must because there doesn't seem to be any leadership to fill that vacuum.

Now, if that is not a fair statement of the case, please correct me. You seem to be looking for Federal regulation. I think so many industries under the jurisdiction of this subcommittee, we look for some kind of voluntary action that doesn't force us to come in and bang heads together. We encourage industry to take this kind of action, to make the necessary and appropriate materials available to consumers.

We don't want to be coercive. We don't want to regulate, if the industry has the leadership to do the job themselves. Are you telling me apparently that they don't?

Mr. LANDSTROM. We are still working on it, ever since Congressman Richmond spoke to us at the Manufacturers' Executive Conference. It does take some time.

Mr. SCHEUER. How long ago was that?

Mr. LANDSTROM. That was March of 1979, sir.

Mr. SCHEUER. So you have had about 1½ years. It seems to me that would be long enough to take some action. I just came back from the Rose Garden of the White House. Since normalization of relations with China four major treaties have been signed. That is less than 2 years, and that is more complicated than getting out warning labels showing people how to use a paint product.

You have been at it for 1½ years. How much more time do you think you need?

Mr. LANDSTROM. Most likely another year.

Mr. SCHEUER. You need 2½ years to convince your manufacturers to put a little label on a can or on a tube?

Mr. LANDSTROM. They have to redesign their tubes. They have been changing and putting new labels on them, yes. Just like I have shown here. The tube that Congressman Richmond showed this afternoon is an old tube. It had no label on it. If I had that same color, it would have a label on it, because it is now labeled.

Mr. RICHMOND. As the chairman mentioned, Mr. Landstrom, we discussed all of this 1½ years ago, and you yourself say that the manufacturers find it very difficult to comply. You know, your whole testimony really is a statement demanding Federal legislation. What you are saying in your entire testimony is that the manufacturers understand the problem, that you understand the problem, that there is a problem, and also you say that you have taken 1½ years to do little or nothing, and it is going to take another year to do.

Aren't you really saying that if we could pass a simple bill mandating reasonable information labels, that your manufacturers would be more than happy to comply with it?

Mr. LANDSTROM. Very much so.

Mr. RICHMOND. Instead of fighting us, you might as well join us, because the overwhelming amount of testimony we have had in these last 2 days indicates that there has been a real demand, a real need. The 54 million people who use these products have got to be told what those products consist of so they won't wet paintbrushes with their tongues and so forth.

I am glad to hear from you that you agree that some reasonable legislation will be helpful to your manufacturers.

Mr. LANDSTROM. You say reasonable, and I would say yes.

Mr. RICHMOND. You heard my opening testimony. All we want is reasonable information, just indicating the contents of the product, indicating the hazards, indicating the antidote, indicating the method of using it. Should you wear gloves; should you not wear gloves? Should you wear a mask; should you not wear a mask? Should you use a product outside or inside? That is very simple.

Thank you very much for your cooperation, Mr. Landstrom. I am glad you agree with us.

70-237 O - 81 - 13

Thank you, Mr. Chairman.

Mr. LANDSTROM. We are dedicated to helping to solve these problems, identifying the hazards, educating the user with respect to these hazards, and to have continuous programs in training the consumer in the use of art material products, how to use them safely by complying with precautionary labeling and printing first aid treatment where proper and necessary.

Mr. RICHMOND. By the way Mr. Landstrom, all those products I displayed here this afternoon were purchased last week from art supply stores.

Mr. LANDSTROM. In my opening statement, I said that we are only one part of the art material industry. Of all those items, those 30 items you had on this table, sir, there are only 4 that represent our industry.

Mr. RICHMOND. We have written you asking you to send us some of your new labels, but we haven't received any. We would like to see——

Mr. LANDSTROM. I brought them with me, sir.

Mr. RICHMOND. I would be glad to see them. Thank you.

Mr. LANDSTROM. End of testimony. Thank you, Mr. Chairman.

Mr. SCHEUER. Thank you very much.

We will now go to Mr. Vukovich, representing the National Ceramics Manufacturers Association.

Mr. Vukovich, your testimony will be printed in full in the record. [See p. 197.] So, you might want to chat with us informally, hitting the highlights, and perhaps addressing yourself to anything that Congressman Richmond or I have said in our remarks or any observations you may have heard from any of the other witnesses.

STATEMENT OF MILAN VUKOVICH, JR.

Mr. VUKOVICH. Thank you, Mr. Chairman.

I would like to address myself specifically to those questions. One is that the NCMA, which I am representing here today, does support cautionary labeling. It has introduced on its own, in its own organization, several forms of cautionary labeling since 1970.

Mr. SCHEUER. What are the several forms?

Mr. VUKOVICH. Rather than go into detail on what they are, I would like to point out that many of the products I saw here, were in violation of the Hazardous Substances Act. Many of those substances are highly toxic and would be classified as hazardous substances. I believe some of the argument is with the Consumer Product Safety Commission, and the enforcement of the present law.

Mr. SCHEUER. Do your labels instruct people as to how they may use that product safely?

Mr. VUKOVICH. Not in the sense that I think the artist was asking for the other day. For example, the artist was asking for clear, concise, and accurate labeling as to how to determine what a well-ventilated room might be. That term is used, I am sure, on some of our products. In fact, it is on a kiln to indicate that when you are firing a kiln, you should use it in a well-ventilated room. This becomes an engineering problem, to define this. If you are involved in engineering, you can't define what is well-ventilated until you get a measurement of what is currently there, what

products are being fired, what products are going to be evolved, what the concentration is of each product evolved.

It is a very complex subject. But certainly I would think to a schoolteacher. It would caution them to the fact that there are exhausts being emitted. Which I was surprised to hear was not clear enough to suggest to a school teacher that when they get a headache, the ventilation was insufficient.

Again, the examples that were given yesterday were organic substances, producing vapors, not inorganic substances that we see in ceramics.

The other problem, as I see the bill, addresses itself to a problem with the term contamination. As I read the bill, and I am not a lawyer, but I attempted very hard to understand it. It dealt with any product that maybe a chronic toxicity material, whether it is there as an added ingredient or as a contaminant.

Now, I have taken that to mean that if you are bottling a material in, let's say, Trenton, N.J., using the Delaware River water as an ingredient in that product, and if Delaware River water contains PCB's, that may require labeling of that product as basically a carcinogen.

I think the condition, as Dr. Goldwater pointed out, and I am merely supporting it, is that the amount of toxic material present is very important!

In ceramics, very many of our materials are naturally occurring materials. We mine them out of the ground. Right now, for example, a very hot item among artists is to use the volcanic ash coming out of the mountain in Washington in some ceramic process. It is not manufactured by anyone. It is created by the eruption of this material. There are some clever people, including artists, packaging this material in a container, selling it for incorporation in some ceramic objects. It makes nice little black specs in the glaze or in the body, and colors it somewhat.

To my knowledge, not many people know what all it contains, but I am sure that if you ran a chemical analysis on it, you could find almost anything, as Dr. Goldwater says is in an orange. Some of those substances are highly toxic.

I heard yesterday testimony that clays have arsenic in them. Of this one particular potters, every clay body be used had arsenic in it. I have been a ceramic engineer for 25 years. I have done analysis on clays. I have had analysis performed on clays. I have never, never seen arsenic in the analysis, but maybe it was because we never looked for it. Maybe it was there. Maybe we didn't have the instruments sensitive enough to determine it. But to label that particular clay substance and to call it toxic, it is more than an engineer can determine, because he is not capable.

The other thing I would like to point out is that very many of these manufacturers are hobbyists or were artists at one time themselves. The fact that they wear the mantle now of the manufacturer makes them no more world knowing about the toxicity of materials than they were as artists.

Mr. SCHEUER. Did you say a moment ago that as a ceramics engineer you couldn't determine toxicity of a sample of clay?

Mr. VUKOVICH. Yes, sir.

Mr. SCHEUER. And that if clay has arsenic in it, you have no way of detecting that?

Mr. VUKOVICH. No, I didn't say that. I said I had never seen it. I have never seen it on an analyses I have seen run on clay. I have never seen it in the clay analyses that I have read. I am talking about commercially mined and sold clays.

Mr. SCHEUER. I suppose if you never looked for it, you never tested for it.

Mr. VUKOVICH. Right.

Mr. SCHEUER. If I sent a sample of clay to you, to the U.S. Bureau of Standards, the National Bureau of Standards, and asked them to test it for toxic chemicals, could they come back and tell me what chemicals would be in there that were toxic, and in what quantities, perhaps also write me a little memo as to how people could use it in a safe way?

Mr. VUKOVICH. I would hate to answer it with one word, but the answer would probably be no. You would have to ask more questions than that, and tell them more things than that. What you are asking, as Dr. Goldwater pointed out, is—let's take, for example, a single material that I point out in my written testimony, silica.

Silica is the cause of silicosis. Silica not as silica is the cause of the silicosis, but as the mineral form, quartz. Now, you can have all the silica you want in a glass or an amorphous form, and it won't do a thing to you. Even if you breath it in as dust, it can cause other lung conditions, but it does not cause silicosis.

So, to just analyze things for its chemistry is not the total answer. Mineralogy may be important. You need to know how much is there. Whether that chemistry is soluble as the material occurs. Many ceramic substances are not soluble, so they are not available to the body.

Mr. RICHMOND. You know, a lot of potters get silicosis.

Mr. VUKOVICH. This is strange to me. I have not run into a potter that has silicosis. I appreciate the fact that they could.

Mr. RICHMOND. No; they do.

Mr. VUKOVICH. No; that they could. I have worked with industry, and have associated with potters, but I don't know of anyone who has had silicosis. Cancers, leukemias—friends of mine even have it, but I don't know they are attributable to exposure to silica.

Mr. RICHMOND. Yesterday we had numerous people who testified that they knew potters who got silicosis, but you don't?

Mr. VUKOVICH. No, sir. I didn't hear of anyone who had silicosis. They were quoting literature. Mr. McCann was quoting literature. It takes quite a bit of exposure to silica, quite high quartz content, I should mention, and for a rather prolonged period of time.

Mr. RICHMOND. Mr. Vukovich, your testimony is strange. You also say, "It is my belief nearly all the known hazardous materials are properly labeled." Do you really mean that? I had 30 products here this afternoon. Not one of them was properly labeled.

Mr. VUKOVICH. As I pointed out to you, I don't think those were properly labeled. As I pointed out to you, I think they are not properly labeled according to the Hazardous Substances Act.

Mr. RICHMOND. They were all bought in artists' supply stores. Many of the 54 million artists in the United States would buy them in good faith. They should have been properly labeled, right?

Mr. VUKOVICH. I agree with you 100 percent.

Mr. RICHMOND. You also agree with our bill, H.R. 6977?

Mr. VUKOVICH. I have said that, but I also said there were problems with your bill, and those are the points I was trying to mention. It does not consider concentration. Concentration is what Dr. Goldwater alluded to.

Mr. RICHMOND. Dr. Goldwater said an orange contains arsenic, and we wouldn't label that. An orange contains such a minute amount of arsenic, it is not dangerous, right?

Mr. VUKOVICH. How much is that minute amount? That is what I am talking about. You heard the testimony of the artists saying they had arsenic in the clay. How much arsenic did it have? Was it soluble, is what I am asking. Those are important questions.

Mr. RICHMOND. We have the Consumer Product Safety Commission to advise us on that.

Mr. VUKOVICH. That is where the problem lies. These substances are toxic today. They are not toxic because they are in an art supply or an art material. They are toxic because they are toxic. Arsenic is toxic, period. If you add it deliberately to a material, it is toxic if it is soluble.

Mr. RICHMOND. Your testimony is just fraught with incorrect statements. You say beryllium oxide is never used by ceramic hobbyists. In glassblowing, you must have some beryllium oxide.

Mr. VUKOVICH. Why?

Mr. RICHMOND. Arsenic is used by glassblowers.

Mr. VUKOVICH. You know more about glassblowing than I do.

Mr. RICHMOND. That is the testimony we have heard.

Mr. VUKOVICH. I didn't hear it.

Mr. RICHMOND. All I am saying is, wouldn't it be the logical, natural thing to label all these products, those products that are toxic?

Mr. VUKOVICH. The logical explanation of this thing is to write a bill that says, what is the necessary concentration of this toxic material? For example, who is going to determine the percentage of this contaminant? What test is going to determine the percentage of this contaminant? I would say you would not get any more compliance with the new law than you would with the Hazardous Substance Act if you do not address yourself to those questions.

For example, I would say if every manufacturer could send their product in to you and say, "you analyze it, tell us what label to put on it." We will be glad to do it, but some of the questions, are very difficult to answer. Again, there is no way I could describe to you how to ventilate a kiln if I don't know where you are going to use it, or how you are going to use it.

Mr. RICHMOND. At least you could put on your label that that kiln requires ventilation and a person should wear gloves, or a person should wear a mask.

Mr. VUKOVICH. It does. It also says hot surface. A person should see that it is in a well-ventilated room, but it is inadequate in terms of what the artist was seeking. These are the problems. That is all I am trying to state. And the bill I do not think addresses itself to that. It is not just artist materials. It is all materials that would have that problem.

I think ceramic materials are less hazardous than many of the materials you are talking about. In fact, all the materials you mentioned here are not ceramic.

Mr. RICHMOND. The testimony yesterday indicates that artists have tried time and time again to get material safety data sheets from manufacturers, and they have rarely been successful. All this bill mandates is that full safety data has to be included on the package the artist is buying, or a sheet describing the proper way to handle material would be inserted in the box.

This involves 54 million Americans, you know. It is not just a little thing. Many of these Americans are amateurs, and are really not accustomed to reading labels, and are not accustomed to dealing with these substances, and the more information we can give them, the healthier they will be.

Mr. VUKOVICH. More correct information, I agree. Certainly a listing of arsenic as a contaminant in the orange is not good information, you would agree.

Mr. RICHMOND. Sir, if there is a sufficient quantity of arsenic to make that product toxic, it should be listed.

Mr. VUKOVICH. Who is to determine this? This is one of the problems as I see it.

Mr. RICHMOND. The Consumer Product Safety Commission.

Mr. VUKOVICH. There would be no problem if they are the ones who determine whether these substances and mixtures are toxic.

The other thing I would like to point out is that one of the problems that you mentioned here is caused by repackaging of material, which really is in violation of other laws that we have now. Where the material is resold from bulk into another container as a product without proper identification of the source of the material and the name of the manufacturer.

I think there are laws that would restrict that particular type of activity to a large extent, but often times it is the artist, the teacher, the dealer, or retailer other than a manufacturer who is doing that. Manufacturers do it. Repackaging is done at all levels without proper labeling. But I think this can be tackled under present laws.

Mr. SCHEUER. I still have the feeling that there is a real role here to be played by the leadership in your industry group, and it would be a lot easier for everybody concerned if the people who know the realities and intricacies, the permutations and combinations of presence of these toxic chemicals as they are found in a wide variety of different uses, if they would get together and present some kind of suggested standards to us on a voluntary basis, if they would set up the proper kind of format.

We would bless them and say, fine, try it for a couple of years. Maybe we don't need any Government regulation. We are quite conscious of the feeling out there abroad that Government has overregulated in the past, that the long arm of the Federal Government has extended where it didn't have to be extended, but nature abhors a vacuum, and here we see a vacuum.

If nothing else happens, we are going to have to step in and fill that vacuum, and maybe that is the way it has to happen. I don't know. But it seems to me that we have had enough—both the Consumer Product Safety Commission and the Federal Trade Com-

mission have been particularly successful in getting industry groups to set their own standards. They worked with the furniture industry, for example, the Federal Trade Commission has, in setting their own standards for fire protection and other things.

It is really much easier. It is a much more congenial process when the industry knows the problems, knows it better than anybody else, and they come up with suggestions, and frequently the industry groups themselves establish the standards, and by joint agreement, those become the standards for the industry. The industry finds those standards credible, and therefore they live up to the standards, and it avoids the necessity of Government getting into the business of figuring out what the standards are, what the practice should be, and what the label should look like; that is, dotting all the i's and crossing all the t's, and figuring out what the fine print would be.

I would urge you to get together with the leaders of your industry and at least think about whether you can play that leadership role yourselves.

The Consumer Product Safety Commission is coming out for authorization again next year, and we will be having oversight hearings in January or February, perhaps March, and undoubtedly, at that time, if we have not heard from you, we will go ahead and legislate.

I don't think we want to. I think we would much rather—I am positive we would much rather have you do it, but if you don't do it, I think on the basis of the testimony we have had today and yesterday, we will do it.

I want to express at this point my personal admiration and gratitude to Congressman Richmond for having brought this bill this far, having developed the information and having put it in legislative form, and having in effect orchestrated these hearings. I think he has done us all an enormous public service. He certainly has for this committee. There is no question that the witnesses yesterday, the consumers felt that he had performed an extraordinary act of public statesmanship in having taken this leadership role.

I glean from your testimony, too, that you feel this has been a useful exercise which would have never happened had it not been for Congressman Richmond.

So, we will be working informally with him and looking to him for continued leadership and guidance as we move into this area.

I think I speak for him, too, when I say we would much rather sit down quietly with you a couple of months from now, in January, and see what you have to propose for your industry. I hope it works that way. If it doesn't work that way, I think the evidence that has been adduced as a result of these 2 days of hearings would make us irresponsible not to move ahead.

So, why don't we remain informally in touch? Maybe your industry group would think about retaining a consultant, perhaps, to put together some standards, some guidelines, some formats of some warning labels, instruction labels.

Maybe it would be worthwhile to think about getting some professional expertise in these areas of consumer education, consumer information, and consumer protection, and getting him on a retain-

er basis, sort of constricting the time frame. It might help you to put together a useful program.

[Mr. Vukovich's prepared statement follows:]

H. R. 6977

Statement of Milan Vukovich, Jr.

My name is Milan "Mike" Vukovich, Jr. My address is 6912 Africa Road, Rt. #1, Galena, Ohio 43021. I hold a Bachelor's and a Master's Degree in Ceramic Engineering. For the past 18 years I have been employed as the General Manager and Research Director of The Edward Orton Jr. Ceramic Foundation. I am here representing The National Ceramic Manufacturers Association, 59 Main Street, Moorestown, New Jersey 08057.

From time to time I have studied current technical literature as well as reviewed traditional text material. I am familiar with a few of the many materials used in industrial and consumer produced ceramic objects. I am familiar with the technology and processing involved.

From about 1969 to 1979 I had been voluntarily involved in educational and/or labeling programs of The National Ceramic Manufacturers Association in regard to consumer product safety. Initially, these activities centered around the proper labeling and use of lead or cadmium containing glazes to provide for their safe use by ceramic hobbyists, and for making sure the hobbyists made ceramic foodware that would meet FDA requirements. Towards the end of this period my activities and those of the Association broadened to consumer product safety concerns for all hobby ceramic products.

The National Ceramic Manufacturers Association is an association of about 100 manufacturers that manufacture and supply products primarily to ceramic hobbyists. Most of these member companies are owner managed. They employ from 3 to about 250 people and their products are supplied to distributors or dealers that are said to number up to 10,000. These, in turn, sell these products to the consumer and in some cases consume the products too.

The consumers of hobby ceramic materials are large in number - probably greater than one million and less than 10 million persons, they also are very diverse.

The ceramic hobbyist is the greatest consumer of these products, and they are also the greatest in numbers. Typically they are involved about an hour per week with the most avid enthusiasts often becoming vocationally involved as teachers or dealers.

Probably the next largest group of purchasers of these products would be schools and institutions where ceramics is offered as part of art and occupational therapy programs. Typically the student's involvement might be an hour per week to an hour per day over a limited period of several weeks.

Other consumers of these products would include professional artists and potters. Professional artists and potters are typically self-employed and are involved on a full time basis. They have usually studied art in college.

Ceramic technical literature has long recognized that many of the materials used in ceramics contain elements or substances that may be toxic. The technical literature also recognizes and points out that ceramic raw materials are usually obtained from naturally occuring deposits of minerals and rocks, and as such, are quite complex and contain a variety of elements. Furthermore, the actual chemical composition will vary depending on the source of the material or may even vary within a given deposit. The technical literature has also pointed out that even though lead, for example, might represent a large part of the chemical composition of a glaze, it can be present in a very insoluable form and thus present no actual hazard to the user. In fact, the very characteristic of inertness makes ceramics highly desirable for use in foodware and many other chemical and technical applications. Recently, it is being suggested that ceramics may offer promise for the safe disposition of toxic industrial wastes.

Many ceramic raw materials, like the finished product, are often relatively inert or insoluable materials. So even though a toxic element is contained within the rock it would not be readily assimilated if ingested.

Technically trained individuals are generally cautious in the selection and use of ceramic raw materials, or in describing their toxic or non-toxic character. For example, laypersons will quickly point out that silica (silicon dioxide) causes silicosis, and that silica is common to ceramics. Silicosis is caused by specific mineral forms of silica, the most common being quartz. Chemically combined silicates (such as clay and feldspar), amorphus silica, and glasses containing silica will not produce silicosis.

The college trained artist/potter that has been taught to be creative and imaginative is inclined to be uninhibited in the selection and use of materials. It has also been my observations that these artists also will seek out their own source of material and in some cases actually mine their own materials. They may use and buy chemicals of all types in small quantities. They often weigh and mix their own glaze formulas and often build their own equipment. They are constantly developing their art and the use and selection of the raw materials is a part of that art. They are not likely to use consumer ceramic supplies or equipment. For these reasons, I would feel they are the most likely to encounter toxic hazards if they have not been made aware of the toxic hazards and because they are usually highly motivated individuals, they may be exposed to these substances for longer periods of time.

The ceramic hobbyist, like the elementary and high schools generally rely on consumer packaged products and supplies. They require full and detailed instructions to use these materials. Of necessity these supplies need to be made more problem free if they are to be commercially viable. Since this group deals with prepared consumer packaged supplies the packages are required to carry cautionary labeling in accordance with the Hazardous Substances Act when toxic materials are used. It is my belief that nearly all known hazardous materials are properly labeled.

I have been involved in ceramics for more than 30 years. I have not personally known a single ceramic artist, hobbyist or student that has been affected by toxic ceramic materials. I have heard of one case of dermatitis and/or numbness attributed to barium carbonate. This was said to be a professional potter that worked directly with the barium carbonate, incorporating it in the products he was making.

H. R. 6977 is said to provide the Consumer Protection Agency with the authority to issue regulations concerning substances that cause chronic illness by including chronic toxicity under the definition of hazardous substances. This appears unnecessary since the Hazardous Substances Act Regulations include toxic substances and states (in 1500.3 (b)(5)),"Toxic shall apply to any substance (other than a radioactive substance) which has the capacity to produce personal injury or illness to man through ingestion, inhalation or absorption through any body surface". This definition would seem to include all H. R. 6977 definitions of chronic toxicity except one. Paragraph G (ii) of H. R. 6977 would include in its definition of chronic toxicity, any household substance that contains a chronic toxicity material as a contaminate. Such a position cannot be technically supported. It is also very impractical and would defeat the very purpose of cautionary labeling. Depending on the degree of enforcement, it could appear to lead to the cautionary labeling of any material to which a manufacturer adds water from any major city water system.

Additionally, I would like to correct what I believe are errors that are a part of the statements contained in the Congressional Record of March 31, 1980. Under the heading of "Scope of the Problem", it is stated "I have prepared a list to show a few of the professions which routinely use hazardous chemicals." In that listing under ceramics, glassblowing and enameling are found three items, namely beryllium oxide, manganese carbonate and arsenic oxide. To my knowledge beryllium oxide is never used by ceramic hobbyists or artists. Manganese carbonate may be used to produce some brown colored glazes. Arsenic is never, to my knowledge, used to produce amy product for the ceramic hobbyists. A few old glaze formulas incorporating arsenic can be found in the literature and the existence of these formulas may be the only reason for arsenic's inclusion in this list. Thus, I do not believe it can be stated that these materials are routinely used. Furthermore, if these materials are being used in household products the toxicity of these three materials should qualify them for inclusion under the existing Hazarous Substances Act Regulations.

I also feel I must object to several statements contained in the Congressional Record introducing H. R. 6977. These statements characterize all manufacturers of artists material as negligent, unwilling to regulate themselves, and opposed to the consumer's welfare. This is not the case for manufacturers of ceramic supplies and equipment.

I understand that individual manufacturers of hobby ceramic materials have used cautionary labels for more than 30 years.

The National Ceramic Manufacturers Association first established cautionary labeling requirements for glazes in 1970 and adopted cautionary labeling requirements for kilns in 1975. The Association has also included consumer safety in its teacher certification program. I believe most small manufacturers recognize the consumer as the only source of their income and this income depends upon the consumer's health and existence.

Finally, I would emphasize that public awareness and education are also important to reducing any present and future health hazards. Widespread distribution of factual literature that explains in detail the hazards of toxic materials is important to educating manufacturers, teachers, distributors, and consumers. Material that is factually incorrect or misleading is counterproductive to consumer product safety.

Mr. SCHEUER. In the meantime, we will call the next witness, Mr. Fred Johnson, manager of the product safety task force of the National Paint and Coatings Association.

Mr. Johnson, as you see, this has been a very informal set of hearings. Congressman Richmond and I are sort of involving ourselves, stepping in and out of the conversation as it goes along.

Your testimony will be printed in full, of course, in the record. [See p. 210.]

What I would suggest you do is take 10 or 15 minutes to talk to us informally, right from the heart. You can refer to anything any of the witnesses have said, either today or yesterday, anything that Congressman Richmond has said, any observations we have made today or yesterday, and try and give us as much insight as you can on what the need is, and how we fill that need, what role Government should play, ought to play, must play, what role you think there is in the free enterprise sector, what leadership role you think there might be in your industry.

So, I am very happy to have you here. We are grateful to you for coming. You didn't come to us so far, 1500 Rhode Island Avenue, Northwest. You don't get the door prize for coming the longest distance. But at this point, we turn the floor over to you and listen with great interest to whatever you have to tell us.

STATEMENT OF FREDERICK F. JOHNSON

Mr. JOHNSON. Mr. Chairman, I appreciate that. I am not sure I have the same microphone in the throat that Dr. Goldwater has.

Mr. SCHEUER. Why don't we move the microphone over?

Mr. JOHNSON. That will be a little easier on all of us, I think.

I do want to mention that I am not associated with the paint association. I am employed by the DuPont Co., in Wilmington, Del., so maybe I do qualify for the prize of coming the longest distance.

Mr. SCHEUER. I will sure apologize, because we have you listed here as manager of the product safety task force of the National Paint and Coatings Association.

Mr. JOHNSON. Yes, sir, that is correct. The paint association is an organization that includes most of the manufacturers of paints and coatings in the United States and their suppliers.

Mr. SCHEUER. Paints and coatings?

Mr. JOHNSON. Yes; within the organization, there are several groups that are involved in association activities, including welding. The group that I happen to be involved with directly is a group called the product safety task force. Our interest is primarily in the effective legislation, regulation, any external activities which may impact on the formulation of our products, the way they are used, the kinds of limitations that may be placed on them at some future time.

Before we get into it, I also want to mention that I have with me today two representatives from the NPCA staff, Mr. Hugh F. Young, Jr. legislative counsel——

Mr. SCHEUER. All right, the National Paint and Coatings Association.

Mr. JOHNSON. Mr. Patrick J. Hurd, who is an industrial hygienist over at the NPCA.

I would like to take advantage of your offer to kind of summarize and chat a little bit, and make ourselves available for questions.

Yesterday, we heard some comments on the potential hazards of art materials that were absolutely appalling. It is the kind of thing that frankly is hard to believe, the fact that there is a group of people that large who don't have the kind of information that they are looking for.

Over and over again, there were requests for additional information. I think that there is an obligation to supply that information to those people. Previously, we talked about the possibility of having an educational, instructional program, and if this is the way to go, whether it includes labeling or not, if that is the way to go, believe me, I am able to commit the National Painting and Coatings Association to active participation in that program right now, today.

Mr. RICHMOND. Mr. Johnson, just a simple material safety data sheet in your package would save an awful lot of trouble for everybody, and it would certainly be at miniscule cost to the manufacturer.

Mr. JOHNSON. We supply material—most of our members—all members of the Paint and Coatings Association will supply material safety data sheets on request in some cases.

Mr. RICHMOND. All day yesterday we heard from a number of people, and we also heard from Shirley Levy today that they tried countless times to get material safety data sheets, and they were never available. Ms. Levy, if she is still here——

Mr. JOHNSON. I have no reason to doubt her statement.

Mr. RICHMOND. All the products I showed you today didn't have any safety data sheets on them.

Mr. JOHNSON. In general——

Mr. RICHMOND. They generally don't.

Mr. JOHNSON. The Paint and Coatings Association are not manufacturers of art materials. There are two general types of paints and coatings that are manufactured by our members. Those are supplied to consumers for painting the house and rooms, what have you, those used in commercial and industrial applications. Very few of our members are actually involved in the manufacture or distribution of artists' materials.

Regardless of the experience that the witness may have had with getting some material safety information, I sincerely believe that any material safety data sheets would be available from any member of our association.

Mr. SCHEUER. Let me say arguendo, assuming what you say is correct, that that is far from good enough. We don't say in the field of drugs that we will give you the information if you ask for it. We don't say in the field of consumer product safety of any kind, in the field of asbestos hairdryers, if you want the information, ask for it.

We require the manufacturers of drugs and other products that are of potential hazard to consumers to put in what the average consumer needs. We could never have a consumer program of any kind if it relied on people reaching out and asking for something. You know that from your own experience. That is a grossly inadequate program. The intellectual underpinnings of that program are totally flawed.

Mr. JOHNSON. I think there is certainly room for improvement.

Mr. SCHEUER. That is the masterpiece of understatement of the year. The question is, how do we get from here to there? How are we going to put together the program? Do you want us to do it for you, or would you rather do it for yourselves? Perhaps take the responsibility, as you heard me say, as other industries have done, with the Consumer Product Safety Commission, also with the Federal Trade Commission.

We would prefer on a voluntary basis that you fellows do the work on something that you know far better than we do and, I assume, far better than the Consumer Product Safety Commission. You have the experts, hygienists and so forth. What is the title?

Mr. HURD. Industrial hygienist. Sometimes referred to as industrial hyenas.

Mr. SCHEUER. You have the expertise. You are a very impressive gentleman.

Mr. JOHNSON. Thank you.

Mr. SCHEUER. Why can't a few of you guys get together and go to the industry and make a really creditable effort to put together a package of informing consumers, A, as to what they should worry about, the degree of danger, what kind of chemicals, what would be the emergency treatment, and how can they use the product safely, in an intelligent way, what other reasonable precautions they ought to be taking?

That doesn't seem to be much.

Mr. JOHNSON. Mr. Chairman, we certainly will accept that challenge. I am not sure the material safety data sheets are the appropriate way to go. They may be meaningful for a lot of people, but in general the data sheets were put together for health professionals, for industrial hygienists.

Mr. RICHMOND. They could be put together for consumers, too, couldn't they?

Mr. JOHNSON. They certainly can. At this stage of the game, the requirement for safety data sheets under the Compensation Act are directed to legal requirements, existing statutory requirements.

Mr. RICHMOND. Mr. Johnson, I am sure that you, Dr. Goldwater, Mr. Vukovich, and Mr. Landstrom all agree that legible, simple consumer product data sheets could be put together for every one of these products, and it could be easily added to the product package, right?

Mr. JOHNSON. I think there is a great deal of information that can be included.

Mr. RICHMOND. And the cost would be negligible, as the Chairman said. If we had that, then we wouldn't need any legislation.

Mr. JOHNSON. I am not prepared to speak to the cost. I really don't know. But I am sure that there is a lot of information that can be included on a consumer product label. The paint association in the past has developed labeling suggestions for its members. Those suggestions are based on the association's interpretation of the existing laws and regulations.

This started back in about 1958, and it has been constantly improved. The most recent issue of the labeling guide came out in 1972, and therein it interpreted the legal requirements. It made the point that it is important for each manufacturer to label his prod-

uct to represent the hazards that are actually involved in it, and we continually update that labeling guide.

This is perhaps not enough to do the job, but we are willing to accept the challenge of taking the lead within our industry. We represent more than 90 percent of the paint manufacturers in the States, and I think we can influence their activity.

As far as the bill itself is concerned, we understand that the intent is to reduce or eliminate the hazards, or potential hazards in the art materials field. As we read the bill, it applies to all materials that are now regulated under the Hazardous Substances Act. The consumer paint materials that our members make are manufactured for industry and consumers are now controlled by the Hazardous Substances Act, and consequently, the trade association has an interest above and beyond the art materials field in H.R. 6977.

Our position on the bill is flat out in support of the concept of product hazard labeling. There is no question about that. We do have to add to that that we have some reservations about portions of the bill, and are opposed to portions of the bill that we feel are perhaps unnecessary or need some language clarification in order to make the bill workable, unfortunately.

Mr. SCHEUER. Let me say that I would hope that you would be working informally with Congressman Richmond, who has taken the lead on this, and his very able staff people, and my staff people, to see if we can't work out language that you would find quite acceptable.

Mr. JOHNSON. We would be more than happy to do that. Perhaps it won't serve any purpose to discuss in any detail changes in language that we would like to have today, but I would be glad to do that if it is worthwhile.

Mr. SCHEUER. No, I think you ought to meet informally with the Congressman and his staff and our staff people and work it out. You have been very forthcoming and very openminded. We want to create a system or a process that will produce the results we want, which is protecting consumers, in the most cost-effective fashion, with the least disruption of your manufacturing process, the least out of pocket dollars, and in a way that will minimize the discomfort, inconvenience and expense.

Mr. JOHNSON. We are certainly in support of that approach.

Mr. RICHMOND. Mr. Chairman, could I request from Mr. Vukovich, Mr. Landstrom, and Mr. Johnson that their associations supply us with material data sheets for all of their products, and labels?

Could you supply us with the material safety data sheets and the labels of your clients? It would give us a very good base upon which to move forward.

You say, Mr. Landstrom, that many of your members have changed their labels. Well, why don't you let us see them? Let us see the safety data sheets. And Mr. Vukovich, and Mr. Johnson. Perhaps that is one way we could get started on this.

Would that be possible?

Mr. JOHNSON. I am not sure you want all that paper.

Mr. RICHMOND. A reasonable sample.

Mr. YOUNG. No problem. No problem.

Mr. RICHMOND. When you talk about these sheets having to be too complicated, let me just read the Ashland Chemical notice on hexane. All it says is:

> Information suggests that hexane has the potential of causing serious nerve impairment, and possibly even nerve damage known as peripheral neuropathy, on prolonged or repeated exposure. While Ashland cannot confirm the hazard type or degree of overexposure, due to the seriousness of this potential hazard, Ashland recommends avoiding all forms of exposure.

Mr. JOHNSON. I think that is a perfectly straightforward thing.

Mr. RICHMOND. Is that so complicated you can't understand it?

Mr. JOHNSON. No, it is not. On the other hand——

Mr. RICHMOND. It does say that you had better be very, very careful.

Mr. JOHNSON. Yes. On the other hand, if you prepare a material safety data sheet for a complex mixture like a paint, the listing of hazardous materials may become more lengthy. The amount of comment may become more involved. It is not as simple as preparing a material safety data sheet for a simple single chemical substance. But certainly it is done.

Mr. SCHEUER. It seems to me if you are designing something for consumers, you might not even bother to list them. You might simply say, this paint or this varnish contains a number of chemicals which may have severe toxic effects if they aren't used very carefully. Here is our suggestion as to how you use them carefully, and here are our suggestions as to emergency treatment if ill effects are felt.

As a consumer, I don't need two dozen names of chemicals which don't mean a damn thing to me anyway. All I want to know is, is it dangerous, and if it is dangerous, what do I do in the event that my child or somebody else suffers ill effects? And third, and probably most important, how can I use this product safely?

Mr. JOHNSON. Right.

Mr. RICHMOND. Should I wear gloves? Should I wear a mask?

Mr. SCHEUER. That is right.

Mr. JOHNSON. In traditional labeling language, the language of art in this case is, "Avoid contact with skin." If the only way you can avoid contact with the skin is to put on a pair of gloves, that is a logical conclusion to make from the statement, "Avoid contact with the skin."

If a label statement is made that says, "Avoid" or "Do not breath vapor," that is a rather strong statement. Then I think an intelligent man or woman would take precautions that may include the use of a respirator to avoid breathing.

Mr. RICHMOND. Or he might use that product outside.

Mr. JOHNSON. That is possible, although exterior use doesn't guarantee that you won't inhale some vapor.

At any rate, the suggestions for labeling that are made by the paint association to its members now include these kinds of things, and beyond that, reflect the requirements, including the language requirements that are now specified under the Hazardous Substances Act.

Mr. Young may have some additional comments he wishes to make along those lines, and if there is no objection——

Mr. RICHMOND. Absolutely.

Mr. YOUNG. Mr. Scheuer, Mr. Richmond——

Mr. SCHEUER. Would you identify yourself?

Mr. YOUNG. I am Hugh F. Young, Jr. I am legislative counsel for the National Paint and Coatings Association. We have provided to you through Mr. McLaughlin a copy of the National Paint and Coatings Association industry labeling guide for the paint industry. It is that blue volume that is up on the front desk. The minority side has also been provided a copy through Ms. Nord.

I would be remiss not only to the industry I represent but also to this committee if we allowed these hearings to conclude with the feeling that the industry has been totally unresponsive and uninterested in this subject. That labeling guide speaks for itself. It is a massive undertaking. The sole purpose to have it is to make sure our members know what is required of them in the Federal Hazardous Substances Act. There are specimen labels contained in there.

Time and time again yesterday we heard witnesses from the artist community saying that the words used are not adequate. I would like to point out very respectfully to this committee that they had the agency before them yesterday, the Consumer Product Safety Commission, that is required to write the magic words required for manufacturers to put on their products.

I don't want to go through the exercise, although I will be happy to provide this subcommittee at any time with a step by step run-through of both the Federal Hazardous Substances Act and the Code of Federal Regulations implementing that act, that require you to use certain words on your label in order to be in conformance with the act, and in fact, if you don't use those words, you have misbranded products that are subject to seizure by the CPSC.

So, the idea that somehow we invent words to obfuscate the danger associated with a hazard is simply incorrect. Time after time in that guide we refer to sections of the Federal Hazardous Substances Act, in CFR 1500 point whatever in terms of where the authority is that requires that label.

I would like to read to you—I would like to have this be part of the record of this hearing. The National Paint and Coatings Association has a labeling committee. That labeling committee—the staff individual who heads it is Mr. John Montgomery, who is vice president and general counsel of NPCA, and he is in the audience.

I would like to read into the record a recommendation—in fact, it is a formal position adopted by NPCA in June of 1978.

> Until all interested parties can define chronic hazards and testing therefore, the NPCA labeling committee can adopt standard labeling for those hazards. Until that time, individual manufacturers must continue to be responsible for labeling such products based on best information available to them, and are encouraged to include warnings about known chronic hazards in labeling and or literature, for example, MSVS sheets.

Mr. Richmond, we don't have any disagreement——

Mr. SCHEUER. He doesn't include in that recommendation to manufacturers what their obligations might be, the provision of any information as to how to use the product safely.

Mr. YOUNG. Mr. Scheuer, I am glad you raised the point. We heard yesterday about various products that are being used. Is it Ms. Laddon who testified last, mentioning the use of strong solvents, because she has a particular silk screening process that requires strong solvents to dissolve the lacquer that she uses?

In order to anticipate every possible use of a product—first of all, you can't. You can't anticipate every possible use. You can certainly anticipate those that are reasonable. But we think that the information that we are providing now, which is in conformance with FHSA, is adequate to warn of the acute hazard, and Mr. Richmond, we agree with you in terms of provisions for chronic hazard labeling. The problem that we have, sir, is not with the philosophy of that position.

On behalf of the association, we would like to take a leading role in working with you, with the artists who testified yesterday, with industry groups, with anyone who would like to come up with a scheme to provide the information.

Mr. RICHMOND. As the chairman recommended, we all ought to get together informally and work on it.

Mr. YOUNG. I agree.

If I could make just one point, the idea of knowing—knowing, Mr. Richmond—what a chronic hazard is—for example, the carcinogenicity section of the bill has an automatic trigger in it, notwithstanding the provision that that could be triggered by not even an agency's finding, not even a formal rulemaking, but some other learned bodies.

Now, the question that Mr. Luken asked this morning, I think, deserves a little bit more, or rather, this afternoon, deserves a little bit more explanation.

That is, we have an Administrative Procedures Act. All we want is an opportunity to go before the agency while they are considering that so that we can make our pitch. In a minute, I would like to defer to my colleague, Mr. Hurd here. The National Paint and Coatings Association has spent over half a million dollars on an epidemiological study of the paint workers in our industry, not because this subcommittee or Congress or the CPSC or OSHA required it, but because we care about the safety not only of the people who work in our industry but also of the people who use our products.

So, the history on behalf of NPCA and the general paint and manufacturers is one of interest. Mr. Montgomery participated in your colloquy a couple of years ago on the idea of labeling legislation.

We accept the challenge. We will work with you. We look forward to working with you. In answer to the question of, do we need to have this subcommittee act on this legislation in order to get us to move, no, because we have been moving before. Evidently, we haven't done a very good job of communicating it to the subcommittee.

Thank you.

I would like to introduce Mr. Hurd——

Mr. JOHNSON. That is just about what I was going to say. Thank you.

Mr. YOUNG. I would like to defer to Mr. Hurd, if you have no objection.

Mr. SCHEUER. No objection whatsoever. Let me just say, there may be an absence of communication here, but even with improvements in communications, I think there is a recognition on the part of the witnesses today that further work needs to be done by

your industry. I think we have a general alliance on which we hope you will proceed. I hope you will use the 3 or 4 months before we begin deliberations at the end of January or February to engage in some intensive efforts, particularly in the labeling area, and particularly advising consumers how to use the products safely.

Little has been done along those lines. The target of opportunity is clear, and we hope you will move toward it. We will be happy to work with you informally, to the extent that it seems useful.

Mr. HURD. Thank you, Mr. Chairman.

As you have heard, we have not stood idle. NCPA and its members have been doing what we thought was necessary in the absence of any prodding or intervention by the Federal Government.

One thing that Mr. Young mentioned was our epidemiology study. We are quite proud of that. The leaders in the industry several years ago recognized that there was a proliferation of reports about different chemicals causing different hazards. No one had looked to the great expanse of the paint and coatings industry as to whether the employees of the industry were experiencing the same hazards.

So, back in 1975, they commissioned SI, International, a very recognized, well known, independent research organization, to look at whether or not the mortality experience of workers in the paint and coatings industry was different from that of the general population. We have provided you with a copy of the executive summary [1] of this study.

We are concerned about chronic hazards. One thing that we haven't talked about yet today or yesterday—well, it was mentioned a little bit yesterday. Unfortunately, science has not caught up with what we recognize as the problem. We are constantly trying to develop new test protocols. We are constantly trying to assess the relationship between chemicals and cancer. This is the purpose of this study. It is only the beginning.

I have been on staff only for 3 years. Our trade association recognized the need for a professional capacity in the area of health and safety. The moneys we have spent on this mortality study, which has prompted further studies for particular causes of death that need further investigation, will continue. We have also been involved in a program to design a hazard warning program for paint manufacturers, a simple way to apprise workers of the hazardous materials that they use. In a paint plant, you have several thousands of materials.

So, we are active. We are continuing to be active, and as you have already heard—I won't repeat again—we pledge to do that more.

Mr. SCHEUER. That is very encouraging. This is the leadership in the industry that we were looking for, and that we hope to stimulate.

Let me just say in the tobacco field the American Tobacco Institute hired all kinds of scientists and research institutions and over a decade, or more than a decade, they sought to prove that there wasn't any finely tuned cause and effect relationship that had ever been proved between smoking cigarettes and lung cancer.

---

[1] The summary may be found in subcommittee file.

That was a very negative effort, in my opinion. Maybe it was because from the point of view of preventive health there was nothing they could have told smokers except, lay off, chew gum. Maybe from the point of view of that industry, the only thing they could do was debunk the research, as the case became more and more compelling, as the statistical predictability of a higher incidence of death and serious illness through lung cancer with increased levels of smoking became more and more clear.

I am very much impressed by the cooperation that you just identified in saying, look, we think there may be some hazard here in the use of this product. We are not quite sure what. It hasn't been identified. But we advise you to take reasonable precautions. I hope that is the tack you will take.

It seems to me that is the fruitful approach. It seems to me that you don't need to spend a lot of money on epidemiological studies, although down the pike maybe that should be done, too, but at least now you probably have the data base to know which ones of those products are potentially hazardous.

I think it would be in the cause of industrial statesmanship to follow this pattern, and say, we are putting out a product that may have toxic substances in it, and under certain circumstances it may present very real health dangers. Here are the dangers, and here are the emergency treatments. Here is the way we think you can use our product sensibly, cautiously, carefully, so that it will perform the service you want it to perform without any of these threats to your health.

I would say there is an awful lot that can be done even in the absence of the epidemiological studies that would dot every last "i" and cross every last "t", and I hope we will be moving down that road.

Mr. JOHNSON. Mr. Chairman, I think it is important to note that the results of the initial epidemiological study were very favorable. This doesn't mean that the paint industry doesn't use hazardous materials in the manufacture of its products, but it means that those hazardous materials can be used in a way that is safe, as much as anything else.

There are other considerations, of course, that are involved in the study, but overall, the study was very favorable.

I think it is also important to note that the traditional philosophy of labeling is to do essentially what you are asking for. Traditionally, there is some kind of a signal word that is supposed to be there to catch your attention. That is the danger, warning, caution, kind of thing. The second element, normally there is some kind of affirmative statement of the hazard or hazards.

The fact that most labeling in the past has made those statements in terms of acute hazards, flammable, may be absorbed by skin, may cause skin irritation, this kind of thing, the fact that those have been related specifically to acute symptoms in the past doesn't mean that they can't be expanded when the test protocols are there to define the hazardous material, the end point of the study, and this sort of thing.

Beyond that, traditional labeling lists actions that must be done or avoided to avoid the consequences or to avoid the things that are stated in the statements of hazard. First aid information is added

where it is appropriate. Storage instructions, where they are appropriate.

Those elements are really——

Mr. SCHEUER. Use instructions? Instructions on use?

Mr. JOHNSON. I am not really sure what you mean by use instructions, unless that comes into the section on actions to be taken or avoided. Those are use instructions. There is no question about it. But in addition to that, in the case of paints, there are other use instructions, like clean the surface, and put it on with a brush or a roller.

But the essential, basic elements of product precautionary labeling, I think, satisfy the kinds of things you want to do.

Mr. RICHMOND. I think there is no question that we all agree that labeling of artist materials right now is not adequate. Is that correct?

Mr. JOHNSON. I am not in the business of art materials, but from the examples I have seen, I would say that certainly there is a big gap.

Mr. RICHMOND. We are not adequately protecting the health and well-being of artists in the United States. There are 54 million people involved in the arts in the United States. There are a lot of consumers. So, we all agree something has to be done. Let's start working together. As Chairman Scheuer said, let's work informally to see if we can develop material directed to the consumer, not to industry, but to the consumer, legible, simple material that will tell the consumers, the 54 million consumers, exactly what Chairman Scheuer said: What is in this product, what should be avoided, how it should be used, and what to do if it is ingested, inhaled or absorbed.

Mr. JOHNSON. Fine. We are certainly willing to cooperate in that kind of a program.

[Testimony resumes on p. 224.]

[Mr. Johnson's prepared statement follows:]

TESTIMONY OF

THE NATIONAL PAINT & COATINGS ASSOCIATION

Mr. Chairman, and Members of the Subcommittee, my name is Frederick F. Johnson, and I am here today testifying on behalf of the National Paint and Coatings Association, where I serve as Manager of the Product Safety Task Force. I am accompanied today by Hugh F. Young, Jr., Legislative Counsel for the Association and Patrick J. Hurd, Industrial Hygienist, also of N.P.C.A.

Our Association, Mr. Chairman, represents the manufacturers of approximately 90% of the $7 billion in annual sales of paints, varnishes, lacquers and allied products. It also represents major suppliers of raw materials and equipment used in the manufacture of paint. About one-half of the coatings produced in the United States are factory applied to new products (e.g. automobiles, appliances, furniture) and about one half are used to beautify, maintain, and protect surfaces in residences, public buildings, and factories.

At the manufacturing level, N.P.C.A. member companies provide employment for approximately 60,000. Several hundred thousand people are employed at the retail level selling paint and allied products.

Mr. Chairman, in my role as Coordinator, Consumer Interests of the Finishes Department of E. I. duPont de Nemours & Co., Inc.,

I have been directly involved in labeling and product safety issues since 1958. I would like to thank you and the Subcommittee for providing the National Paint and Coatings Association this opportunity for the presentation of our views on H.R. 6977, amendments to the Federal Hazardous Substances Act.

Mr. Chairman, in your letter inviting us to testify at these hearings, you asked that in addition to our general views, we address the following two specific issues:

1. The effect, if any, of the proposed legislation on the members of NPCA.

2. Our assessment of the need for more comprehensive labeling of artists' materials.

You have already heard today from a spokesman for the National Artists' Materials Trade Association. Given the nature of the product groups which we represent (industrial coatings and consumer products) we are not in a position to speak specifically to the narrow issue of labeling artists' materials.

However, since our products <u>are</u> covered by the Federal Hazardous Substance Act, any amendment to the Act, particularly one embracing such a broad, fundamental change in the way <u>all</u> consumer products are labeled (not just paint or artists' materials), is obviously of direct and immediate concern to us. Thus, in addition to some general comments about the legislative approach of H.R. 6977, I will confine my remarks

to the consumer products side of the paint and coatings industry.

H.R. 6977 amends the Federal Hazardous Substances Act (15 U.S.C. 1261 et. seq.) by expanding the present definition of "hazardous substance" to include substances possessing "chronic toxicity" if they are capable of being ingested, inhaled, or absorbed into the human body. The bill also amends the definition of the term "toxic" (15 U.S.C. 1261 (g)) by adding to the definition substances which:

1. cause tumors or cancer in humans or other mammals
2. cause any adverse reproductive effect
3. cause any adverse effect upon the central or peripheral nervous systems
4. causes any other chronic effect determined by the Consumer Product Safety Commission and not included in 1,2, or 3 above.

H.R. 6977 then goes on to require certain labeling for products fitting the expanded definition of "hazardous substances."

Mr. Chairman, let me state that N.P.C.A. supports the concept of labeling for hazardous substances, and supports the concept that substances shown to have chronic hazards associated with their use should be labeled specially. Thus, conceptually, N.P.C.A. endorses what Congressman Richmond's bill attempts--coming up with a logical scheme for a definition of what a

chronic hazard is, and then labeling for it. However, there are a few quick points I would like to make about the bill's approach.

Arguably, under the present definition of the word "toxic" the CPSC already has authority in the chronic hazard area. That present definition states:

> The term "toxic" shall apply to any substance (other than a radioactive substance) which has the capacity to produce personal injury or illness to man through ingestion, inhalation or absorption through any body surface. (15 U.S.C. 1261 (g))

Clearly, cancers, tumors, adverse reproductive or genetic effects or damage to the central or peripheral nervous systems qualify as "injury or illness" under this present definition. Thus, unless the CPSC, which administers FHSA, can develop some compelling argument about why the present definition prevents them from acting in this area, we do not feel as though the first sections of H.R. 6977 do anything other than restate what CPSC is already authorized to do, and in fact, this bill would provide a legislatively-devised scheme that the agency is already working hard to develop along the administrative route.

On July 8, 1980, the CPSC issued a Request for Proposal (RFP) CPSC-P-80-1432, entitled "Establishment of a Coordinated Interagency Regulatory Liaison Group (IRLG) Labeling Strategy

for Toxic Chemical Substances." The scope of the project covers substances with the following hazards:

1. flammability
2. corrosivity
3. irritants
4. carcinogenicity
5. mutagenicity
6. teratogenicity.

These latter three hazards are chronic, as opposed to acute hazards.

Background documents for this Request for Proposals further outline the role of the Environmental Protection Agency and the Occupational Safety and Health Administration, in developing hazard warning information. Thus, not only does it look like the CPSC is working to develop ideas in the chronic hazard labeling area, it also appears as though the agency is attempting to do it in a realistic, coordinated way with other agencies involved in the issue. In fact, there is at least implicit acknowledgement of the role that such an interagency group might play in the development of labeling requirements for chronic hazards in the language of the bill itself. In Section Two, on page 5, lines 3-11, the EPA, FDA, and OSHA regulatory activity in the carcinogen area becomes part of the scheme for identification of which substances possess "chronic toxicity" under the bill.

Given the enormous complexity of hazard identification, the National Paint and Coatings Association feels that the regulatory agencies, under specific policy guidelines from the Congress are the proper bodies for the development of acute and chronic labeling requirements, and that to accomplish that goal, the CPSC already has the authority to regulate in this area.

Assuming, however, that the Congress chooses to act at some future time and grants additional authority, we would hope that any amendments to FHSA requiring chronic hazard labeling would assure that a finding of significant risk of exposure to a toxic substance be required before labeling requirements for the hazard are triggered. Where you draw the line, is, of course, the critical issue. However, our interpretation of the language of the bill would lead us to conclude that there are instances where the chronic hazard labeling would be required automatically, without any particular relationship between the level of exposure that was found to cause the chronic hazard in a valid test, and the amount of exposure that might realistically be expected by using a product containing such a substance. We feel that there must be that relationship before special hazard warning labeling requirements are triggered.

Congressman Richmond, in the introductory remarks to his bill

observed:

> In the past, determining the chronic toxicity of most chemicals and substances was either too costly, too time consuming, or technologically impossible. Fortunately, scientists have now developed tests for determining chronic toxicity of many substances thus changes in the law that I am proposing are both timely and reasonable. (Congressional Record, March 31, 1980, p. E. 1686)

Unfortunately, while tests to detect the presence of toxics have advanced tremendously, test protocols to show that minute amounts of toxic substances cause certain results have not developed at the same pace. This lack of concrete information is acknowledged in a recent, landmark Supreme Court case. In Industrial Union Department, AFL-CIO v. American Petroleum Institute et al, the Court observed:

> Given the conclusion that the Act empowers the Secretary to promulgate health and safety standards only where a significant risk of harm exists, the critical issue becomes how to define and allocate the burden of proving the significance of the risk in a case where scientific knowledge is imperfect, and the precise quantification of risks is therefore impossible. 100 S.Ct. at 2869 (1980)

The precise quantification of risk is impossible, and perhaps there is no better example of the issues raised when one attempts to eliminate risk than the struggle that the Congress and the FDA have been involved in in trying to accomodate the absolute nature of the Delaney Clause's prohibition on carcinogens as food additives, with the recognition that minute amounts of a substance may pose no risk whatsoever.

The Delaney Clause, enacted in 1958 as part of the amendments to the Food, Drug and Cosmetic Act, provides:

> No additive shall be deemed safe if it is found to induce cancer when ingested by man or animal, or if it is found, after tests which are appropriate for the evaluation of the safety of food additives, to induce cancer in man or animal. (21 U.S.C. 348)

Over the years, our ability to detect and measure minute amounts of chemical substances have increased dramatically, from parts per million in the 1950's to parts per billion and even parts per trillion today. Complex, computer-generated epidemiology analyses can discover possible associations between exposure and disease previously unsuspected as early as ten years ago. Such technological advances are not reflected in the inescapable logic of the Delaney Clause, which regards all carcinogens, for the purpose of regulation, as unacceptably hazardous. It disallows the presence of any element of risk, however small, and ignores the ubiquity of some level of acceptable risk in modern society. And in speaking of acceptable risk, I am not talking about those situations in which it is known that the level and duration of exposure would be likely to cause some people to contract a chronic illness. What I am talking about is accepting a level of risk at which it is unlikely that anyone will become chronically ill, but at which one cannot prove that there is 100% safety. It means living with reasonable assurance of safety and acceptable uncertainty.

Congress has accepted that uncertainty in other legislation.

The Consumer Product Safety Act of 1972, authorizes the Consumer Product Safety Commission to establish product safety regulations to protect the consumer against unreasonable risk of injury. In Section 9 of the Act, the Commission is required to express the risk of injury that its rule making is designed to reduce or eliminate, and further, must make specific findings in its rule making as to the degree and the nature of the risk of injury its rules are designed to eliminate or reduce. (See 15 U.S.C. 2058)

In more recent action, Congress addresses assessment of risk, not in absolute terms, but rather in terms of a requirement that there be some degree of significance to the harm presented. The House Report on the Toxic Substance Control Act states:

> The Committee has limited the Administrator to taking action only on unreasonable risks because to do otherwise assumes that a risk free society is attainable an assumption that the Committee does not make. (H. Rep. No. 94-1341 at 15)

Federal agencies have already established acceptable levels for substances which possess chronic toxicity. The Food and Drug Administration has allowed several food substances to remain in the market place, without warning labels, even though each has been shown to be carcinogenic in at least one species of mammalian test animal. These substances include: beverage alcohol,[1] calcium,[2] egg yolk and egg white,[3] and caffeine.[4] (notes follow last page of statement).

Furthermore, nature itself creates risks which legislation cannot eliminate. Vitamin A is present in low concentrations in virtually all animals. Yet in high concentrations it can cause toxic effects. Similarly, selenium is a trace metal that is essential for many species, including man. In fact, at certain doses, it may even be anti-tumorigenic in activity. Yet at somewhat higher doses it may be carcinogenic to animals. In these cases nature demonstrates that the mere presence of a substance which, in the language of the bill "possesses chronic toxicity" does not necessarily present an unreasonable risk of injury, and in fact, in the case of selenium, may be beneficial to life. Thus, levels of risk are an axiom of nature itself.

While "acceptable risk levels" have been established in various statutes and regulations and, as Congressman Richmond correctly points out, scientific studies on many substances have been undertaken, the simple fact is that we have really only begun to scratch the surface of our understanding of the complex relationship between chronic effects, and which chemicals produce them. For example, we still have a long way to go to develop test protocols to better assess the chronic hazards of complex mixtures, the synergistic effects of combinations of substances must be explored, and the mechanism of cancer causation must be studied further.

Our Association has not stood idle in this regard. In 1975, the members of NPCA embarked on a major research effort to determine scientifically if unrecognized hazards in the industry were affecting the health of employees. NPCA commissioned SRI International to conduct a general mortality study of paint and coatings production workers and to develop a medical surveillance system to provide a continuing flow of data for further study. The study, recently completed, will be published in the Journal of Occupational Medicine. The study was designed to be "hypotheses generating." As expected, the results prompt further study and investigation, and NPCA is sponsoring studies to further evaluate and validate various aspects of the data on mortality from certain causes of death to assure that there is no occupational causation. And Mr. Chairman, let me add that NPCA undertook this study not because it was required by Congress, and not because we were trying to pursuade an agency on some rule making affecting our industry. We did it because we care about the very issues that have been raised in these hearings, and which concern us all--our health in the workplace, and our health as it is affected by exposure to chemical substances.

Along with our concern for employee health and safety, NPCA recognized many years ago the need to apprise our customers of the potential hazards associated with the use of our products. Even before the enactment of the Federal Hazardous

Substances Act in 1960, NPCA developed a number of recommended precautionary labels and had published a guide--entitled "Labeling Laws and Regulations"--to assist industry members in complying with then existing Federal and state labeling statutes and regulations.

The regulations to implement the Federal Hazardous Substances Act, developed and promulgated by the FDA in 1962, reflect much study and thought regarding labeling requirements. The sample or specimen labels contained in the Association's labeling guide are based thereon and consistent therewith.

As evidence of that fact, when the Association's first formal labeling guide was developed, the FDA was asked to review the adequacy of the specimen labels in the guide. The FDA, in a letter to NPCA, commented that the proposed labels "appear to meet the letter and the spirit of the law."

The present Paint Industry Labeling Guide was originally published in 1972. It has undergone updating and periodic revision since that time, and a second edition of this Guide was completed and published earlier this year. The Guide now includes guidance for the labeling of both consumer and industrial products of our industry.

NPCA also publishes guidelines for the completion of the Material Safety Data Sheet (MSDS), an "essentially similar" form similar to OSHA-20 prescribed by the Department of Labor.

70-237 O - 81 - 15

While the labeling guide currently addresses only acute hazards, the MSDS guidelines now have a section for describing chronic effects. Further, NPCA encourages the paint and coatings manufacturer to label for chronic effect to the extent that there is sufficient knowledge of the hazard.

Mr. Chairman, in conclusion, I would like to list for you, NPCA's thoughts on, and concerns over H.R. 6977 in it present form:

1. We support the work of the CPSC, and other regulatory bodies in their efforts to devise acute and chronic hazard labeling regulations.

2. We oppose any labeling for chronic hazard that is premised solely on the presence, in any amount, of a toxic substance. Precautionary labeling should be required only when the toxicity of the substance and the anticipated exposure combine to produce a significant risk.

3. We oppose provisions of H.R. 6977 which would require the manufacturer to label products as to procedures to follow to counteract certain side effects. This would border on giving medical advice, and could, depending upon the regulations adopted to implement the provision give rise to unfair product liability claims.

4. We would urge that subcommittee consider language that would make it clear that before labeling for chronic hazards could be required by the CPSC, notwithstanding a study showing chronic effects of a substance, the Commission be required to establish levels of permitted presence of the substance.

Regardless of what action the CPSC and/or the Congress takes in this matter, the National Paint and Coatings Association, as an organization committed to providing our members sound advice on public policy issues, we will continue to urge manufacturers to label their products with precautionary labels addressing all known significant hazards.

We thank you, Mr. Chairman for this opportunity to share our views on this significant piece of legislation.

FOOTNOTES

(1) 38 FR 10460 (April 27, 1977); 39 FR 42748 (December 5, 1976).

(2) Krook, L., L. Lutwak and K. McEantee, Guest Editorial, "Dietary Calcium, Bronchial Tumors, and Osteopetrosis in the Bull", American Journal of Clinical Nutrition, No. 22, pp. 115-118, 2/79.

(3) Szepsenwol, J., Proc. Soc. Exp. Bio. Al. Med. 116:1136 (1966).

(4) Press release, Japan Times, September 22, 1977, quoting Japanese Cancer Research Institute.

Mr. SCHEUER. Mr. Landstrom and Mr. Vukovich, I am sure you agree, and Dr. Goldwater, of course.

Dr. Goldwater, you have been very quiet. What happened?

Dr. GOLDWATER. I was listening. I read the ads about, we have to learn to listen. It is very difficult for me, I assure you. And with all respect to everyone else, I am very sorry that Chairman Scheuer was not here to enjoy my remarks, my contributions. I am sure we could have had some interesting exchanges, and I am sorry about that.

Mr. SCHEUER. Well, they will be in the record, but I am sure it will lose some of the flavor in the printed word.

Dr. GOLDWATER. I might add, in my formal statement I offered to volunteer my services if I can be useful in any way.

Mr. SCHEUER. I am sure you can. We are very grateful for that.

Dr. GOLDWATER. I want to be asked. I am really spending a great deal of my time now, and I don't want to sound too pious, really in public service. I have had a good career, several of them, in fact, and I am ready for another one now. I can't think of a better way of spending some time in the future actually than on this problem, because I have had a lot of experience in it. I have done labeling. I have done evaluations. I have done epidemiological studies. I have done patient evaluation. I have done all of these things, and I think I have something to contribute. I am just waiting to be asked.

Mr. SCHEUER. I am sure you will be hearing from us.

Mr. RICHMOND. Thank you, Mr. Chairman.

Mr. SCHEUER. I want to thank all of you for most thoughtful and stimulating testimony. We look forward to working with you in the months to come. We look forward to the hearings that we will be having, probably early next year.

I want to reiterate my thanks and my gratitude to Congressman Richmond for the really outstanding public service that he has rendered to us all in bringing these hearings together and bringing us together in this room.

Mr. RICHMOND. Of course, I can't end without entering my thanks to Chairman Scheuer and his subcommittee for becoming interested in this most necessary bill. Without Chairman Scheuer, we have nothing.

Mr. SCHEUER. The committee is adjourned.

[The following statements were received for the record:]

The City of New York
DEPARTMENT OF CONSUMER AFFAIRS
80 LAFAYETTE STREET, NEW YORK, NEW YORK 10013
Bruce C. Ratner, *Commissioner*

Comments of
Bruce C. Ratner, Commissioner
New York City Department of Consumer Affairs
Addressed to the
Subcommittee on Consumer Protection and Finance
of the United States House of Representatives
regarding H.R. 6977
Concerning the Labeling of Toxic Artists' Supplies

On behalf of the New York City Department of Consumer Affairs, I urge you to support the passage of H.R. 6977, a bill which would amend the Federal Hazardous Substances Act (FHSA) to require more complete labeling of potentially dangerous artists' materials.

Art and craft activities are extremely popular in America today. With increasing leisure time, there are probably substantially more home hobbyists than the 56.7 million counted by Harris in 1975. Many thousands of commercial and fine artists, who now must use unlabeled or incompletely labeled chemicals to make their living, are currently at work. Practically every school child in this country is given the opportunity to take part in art or craft activities. Considering the vast number of Americans using artists' supplies, it is clear that the safety of these materials should be of great concern to us.

PROPER LABELING OF ARTISTS' MATERIALS UNDER H.R. 6977

Under H.R. 6977, a complete package of crucial information regarding the use of potentially hazardous artists' supplies would

The City of New York
DEPARTMENT OF CONSUMER AFFAIRS
80 LAFAYETTE STREET, NEW YORK, NEW YORK 10013
Bruce C. Ratner, *Commissioner*

Comments of
Bruce C. Ratner, Commissioner
New York City Department of Consumer Affairs
Addressed to the
Subcommittee on Consumer Protection and Finance
of the United States House of Representatives
regarding H.R. 6977
Concerning the Labeling of Toxic Artists' Supplies

On behalf of the New York City Department of Consumer Affairs, I urge you to support the passage of H.R. 6977, a bill which would amend the Federal Hazardous Substances Act (FHSA) to require more complete labeling of potentially dangerous artists' materials.

Art and craft activities are extremely popular in America today. With increasing leisure time, there are probably substantially more home hobbyists than the 56.7 million counted by Harris in 1975. Many thousands of commercial and fine artists, who now must use unlabeled or incompletely labeled chemicals to make their living, are currently at work. Practically every school child in this country is given the opportunity to take part in art or craft activities. Considering the vast number of Americans using artists' supplies, it is clear that the safety of these materials should be of great concern to us.

PROPER LABELING OF ARTISTS' MATERIALS UNDER H.R. 6977

Under H.R. 6977, a complete package of crucial information regarding the use of potentially hazardous artists' supplies would

supplies without knowing that their painting, pottery or sculpture materials are to blame.

Some ingredients now used by artists include:

. Benzene, a highly toxic solvent which can enter the system through skin contact, inhalation or ingestion, and which can cause pulmonary edema, leukemia, or aplastic anemia.

. Carbon tetrachloride, used for cleaning metals, can result in death in large doses and will cause kidney and liver damage in smaller doses.

. Barium yellow, a painting pigment, is a known human carcinogen. In addition, it can cause acute poisoning with symptoms ranging from heart irregularities to kidney damage.

. Talc, although seemingly innocuous, may contain asbestos and/or free silica. If inhaled, these materials can cause lung cancer or scarring of the lungs.

. Lead acetate, a metal colorant, can cause lead poisoning when inhaled or ingested, with symptoms including liver and kidney damage, joint pain, and/or birth defects. Lead acetate causes cancer in animals.

. Catechin, a photographic developer, may be absorbed through the skin as well as inhaled and ingested. This chemical can be fatal. Symptoms of poisoning include anemia, convulsions, vomiting, difficulty in breathing.

Children are especially prone to misusing some materials; their bright colors and appealing textures can tempt youngsters to taste and smell products that may be harmful when ingested or inhaled.

A Department of Consumer Affairs investigator recently visited a number of art stores to find out what they were selling for use by children. Water color paints, colored pencils and colored clays were often mentioned as suitable. However, experts point to preservatives in paints and clays as potential hazards. Colored pencils may contain toxic pigments. "Celluclay", an instant paper maché which was recommended to us, is made from old magazines and is likely to contain lead compounds and/or cancer-causing printing

inks. A batik kit was recommended, which might include hazardous dyes.

The most serious problem we found is that manufacturers do not voluntarily provide ingredient information regarding children's art and craft supplies, so parents and teachers can't really know which substances are safe or what steps should be taken if a material is ingested. It is a serious matter when a child has ingested a substantial amount of a paint or clay, and the parent cannot find out what is in the product. Many of these items are imported, making it almost impossible to contact manufacturers, and doctors are not experts regarding individual craft products. The Center for Occupational Hazards in New York receives thousands of inquiries each year from all over the nation, as concerned adults try to protect the safety of children in their care.

THE ISSUE OF CHRONIC TOXICITY UNDER H.R. 6977

In addition to requiring better labeling of artists' materials, H.R. 6977 would extend the definition of hazardous substances to cover chronic toxic effects. The present law does not cover exposure to substances which do not cause immediate illness, but which over time can result in such serious afflictions as emphysema, nerve damage, anemia, ulcers, kidney disorders, genetic mutations and cancer. Scientific understanding of cumulative toxic effects and chronic toxicity was limited when the FHSA was enacted 20 years ago. The scope of the Act should now be extended to reflect current medical knowledge.

In sum, the passage of H.R. 6977 would provide artists, home hobbyists and school children with information they need concerning the safe use of art and craft materials. Both immediate and chronic toxic effects deserve attention. Once again, I urge you to support this important piece of legislation.

WRITTEN TESTIMONY ON H.R. 6977
Presented to the Subcommittee on Consumer Protection
of the Committee on Interstate and Foreign Commerce
by Joy Turner Luke, Artists Equity Association
September 15, 1980

I am a professional painter and lecturer who represents a national artists' organization, Artists' Equity Association (AEA), in a program to gather information on art materials and also to write a new standard for artists' paints. In connection with this work I am chairwoman of an Inter-Society Color Council (ISCC) committee on artists' materials, and chairwoman of an American Society for Testing and Materials (ASTM) subcommittee, D01.57 on artists' paints and related materials. I was also AEA's representative to the National Bureau of Standards Standing Committee on artists' oil paint. That committee is no longer functioning since the Bureau of Standards has ceased writing voluntary product standards.

Each of these committees include artists' representatives, technical representatives from art material manufacturers and independent experts. In the course of the work of the ASTM committee an effort has been made to collect information about the toxicity of artists' materials with an emphasis on artists' paints since it was hoped to include toxicity warnings among the labeling requirements for paints conforming to the new standard. It is from this experience that I would like to comment on H.R. 6977 introduced by Congressman Richmond. These comments are my opinions and to a large extent also represent Artists' Equity's viewpoint, but I do not speak for the ASTM or ISCC committees.

There is certainly a need to study and appropriately label substances which are chronically toxic, as well as those which are acutely toxic. A large number of individuals throughout this country are permanently injured by substances whose effects are cumulative and only evident over a long period of time. People become ill but even their doctors may not think to connect their symptoms with substances used in their work. This is particularly true in the arts and crafts, where the physician in most cases has little idea of what materials the artist uses. For their part the artist, or hobbyist, using art materials has no contact with sources of information about the hazards of those materials, such as that made available to industrial workers, and therefore regards almost all art and craft materials as harmless. In most cases he or she would not think to describe to a doctor all the materials used. Indeed since the labels on a majority of art materials do not give a list of ingredients, the user doesn't know what substances have been used.

For these reasons it is difficult for anyone to estimate how many people are seriously harmed by materials used in making art objects. The Battelle Labatories report "Product/ Industry Profile on Art Materials and Selected Craft Materials" which was commissioned by the Consumer Product Safety Commission states that, "Excluding photography, the arts and crafts estimated annual average sales are $290-450 million to 25-40 million consumers" (Phase I, page 11). This is obviously a rough estimate, but it does indicate the large number of people in this country using art materials. Children and hobbyists with no training comprise a sizeable segment of this group, but the professional 'fine' or 'commercial' artist has the greatest exposure. They work with a wide range of materials over a lifetime and often live in the same area where they work. They have been encouraged to be experimental with their use of materials and in most cases have no contact with the kind of information about their materials which a manufacturer is required to make available to his employees. Art departments in universities and art schools have failed miserably in educating artists to the hazards their materials may present. Adequate labeling is the only way to reach these millions of users.

Congressman Richmond is to be congratulated on his interest in this serious problem and this effort to correct the worst aspects of the situation. I do, however, have some reservations about certain aspects of this bill.

Since other witnesses are presenting case histories of a number of artists who have become seriously ill using materials they had no reason to believe were toxic, I will attach only a quotation from a Canadian print maker about her health problem. (Attachment 1.) It includes the statement, "My lungs are permanently damaged and I am no longer able to work as an etcher."

I have decided to call to your attention this particular example because a booklet "Health and Safety in Printmaking" has been made available by the Alberta Labour, Occupational Health & Safety Division which describes the toxic materials used in print making, and because a series of graded warning symbols have been developed in Canada to alert users to hazards in all materials. (Attachment 2) England has developed a similar set of symbols. (Attachment 3)

There are two points I would like to make. One is that once information about toxicity is available many more cases will be recognized. The second is that this particular problem is international and other countries are considering solutions. Since several of the larger American art material manufacturers sell their products in other countries, consideration

should be given to what will be required in other countries.

If possible contact should be established with groups working on this problem in pertinent countries and similiar requirements adopted. A national symbol indicating caution when using a product would be effective, an international symbol would be even more effective and would keep the cost of compliance down. If each country requires a different warning text and/or different symbols it will be impossible for the information to go on a tube of paint, it will be confusing and it will drive prices up. I would like to return to the subject of symbols and the warning test which would be required by H.R. 6977 subsequent to some other points.

After stating that warning labeling for chronic toxicity is sorely needed in art materials in general, it is necessary to add that in artists' paints, the field with which I am most familiar, the toxicity problems do not seem as great, except in unusual circumstances, as the hazards in print making or working with ceramics or glass. I agree with Dr. McCann's evaluation published in Art Hazards News, Vol. 3 No. 6, which puts painting in the Moderate Priority catagory rather than the High Priority catagory given painting in the Battelle Report. Conditions which would increase toxicity include heating the paint to a very high temperature, or using it in an air brush where small particles can be inhaled, or art classes where large numbers of students have open containers of turpentine.

It should be stated as an aside that oil painting has always presented fire hazards due to both the flammability of turpentine and the possibility of spontaneous combustion from oily painting rags; but since this hearing is concerned with toxicity these hazards are not germaine.

Information accumulated so far indicates that the main areas for suspected toxicity in artists' paints are the pigments, the preservatives used in the acrylic emulsion paints, and from other additives such as glycol used to protect acrylic paints during freeze-thaw cycles. In each of these areas the situation is better today than it was a few years ago due to interest in toxicity and cooperation by manufacturers.

Pigments which have historically been known for toxicity, such as the arsenic and lead chromate pigments, are not marketed by major American manufactuers. They still come into this country in a few imported lines, but represent

a very small part of the paints sold in this country. The one exception is lead white (Flake white). Artists insisted on an exception to the ban on lead paints because white lead paint used as a 'ground' coat is important to the durability of the painting. White lead now carries a strongly worded warning label.

However, a number of pigments which have always been considered to be safe, ones which have passed mice and rat feeding tests for years, have become suspect in the last few years. Attachment 4 lists pigments for which questions have been raised by one source or another. There are 35 of these pigments and the situation is a little different in each case, but I will take the cadmium colors as an example since they have come under the widest criticism. My information comes from the reports in Attachments 5,6,7,8,9, 10 in addition to references mentioned elsewhere in this testimony. The attached reports represented both the consumer and manufacturers viewpoints.

The cadmium, cadmium-barium and cadmium-mercury pigments are marketed in a series of yellow, orange, and red colors which are very popular with artists and have withstood the test of time for permanence. They form an important part of most manufactuers' oil and acrylic paint lines. The cadmium-barium pigments are the ones most often used because they are the least expensive. The cadmium in these paints is in the form of cadmium sulfide. In this form test through the years done by both pigment manufacturers and artists' paint manufacturers have indicated that almost all cadmium sulfide passes through the body with little or no absorption. (Attachments 6, 9, 10)

Cadmium, per se, has been called as toxic as lead or mercury by the American Conference of Governmental Industrial Hygienists, as quoted on page 3 of Attachment 8, and was implicated in the serious Itai-itai disease in Japan; but if the cadmium is in a form not absorbed by the human body, it would cause no harm. On this assumption plus the fact that there are no cases I have been able to find where an artist was poisoned by cadmium paints, both artists and manufacturers have in the past considered the paints as safe.

An example of tests contracted for by paint manufacturers is Attachment 11 which was done by an independent laboratory for Hunt Mfg. Co., an artists' paint manufacturer, on an acrylic paint "Cadmium Yellow Deep." The test showed no irritation to the skin. The ten rats gained weight on being

fed 5 grams per kilogram of body weight of the paint and showed no ill effects at autopsy 14 days later. It should be noted that this was a test for acute not chronic toxicity.

A few years ago there was an European effort to compile a list of substances which should be catagorized as toxic. The cadmium paints were considered but it was decided not to require toxicity labeling on them. (Health and Safety. The Package and Labeling of Dangerous Substances, Regulations 1978, England).

The comparative insolubility of cadmium sulfide in weak acids is agreed on by everyone, but questions arise over the effects of dry cadmium pigment used in formulating paints by manufacturers and sometimes by individual artists, over the toxic effects of heating cadmium paint sufficiently to turn the cadmium sulfide into cadmium oxide fumes, a much more toxic form of cadmium, and about other possible mechanisms for absorption into the human body besides solubility. The concern is for the long term accumulation of cadmium in the body, especially in the kidneys, and the suspicion that it is a carcinogen.

There have been several studies that show cadmium gradually increasing with age in the general population and then in very old age decreasing slightly. On the carcinogenity issue there has been some evidence on both sides.

Dr. McCann in his book "Artist Beware" does not mention the different forms of cadmium. He reports all cadmium pigments as not being significantly toxic through the skin, but as having high toxicity by inhalation and ingestion. He gives the same inhalation and ingestion rating to the arsenate form of Cobalt Violet which has been widely considered poisonous for two generations. I have been told that an English painter once committed suicide by eating Cobalt Violet. The references McCann gives to support this chapter are secondary sources.

The cadmiums have received the most attention, but for many other pigments listed in Attachment 4 , the evidence is equally contradictory.

In the face of this conflicting evidence both manufacturers and artists' representatives have been unsure of what should be done. Binney & Smith has already put general warnings about care in handling on their tubes of paints and Winsor & Newton puts out a cautionary list which contains a number of pigments including the cadmiums. In both cases their chemists do not believe any real hazard is involved but the companies have decided to take no chances. The

president of Utrecht Linens has told me he is tempted to put warning labels on everything because he can not determine which paints should be so labeled. Other manufacturers including M. Grumbacher Inc., and Hunt Mfg. Co., have expressed a willingness voluntarily to put toxicity labeling on paints where evidence exists and when other manufacturers do the same. They do not want customers to think their paint is more dangerous than similar colors in another line.

In order to further back up the comments I want to make on H.R. 6977, I would also like to describe the situation with regard to one of the preservatives used in water-based paints, formaldehyde. In the first place the well-known hazard of the mercuric preservatives, like that of the lead paints, has already been addressed and as far as I have been able to determine they are no longer being used in the acrylic emulsion paints. All preservatives, since the object is to kill mold and bacteria, are suspect and the list which is approved by the Crayon, Watercolor and Craft Institute for use in children's art materials has steadily grown shorter as information is compiled about toxicity.

In the case of formaldehyde, it is in the acrylic resin which the art material manufacturer buys and combines with pigments and other additives to make an acrylic emulsion paint. It is also sometimes added to the art material as it is being formulated. Formaldehyde is highly irritating to skin, eyes and mucous membrane. It has been implicated as a lung carcinogen. It is a strong sensitizer and causes contact dermatitis in individuals who have become sensitive to it.

The amount used in the acrylic resin in artists' paints is small. The test described by Rohm and Haas in Attachment 12 shows that even in a small closed room painted with an emulsion paint containing 500 ppm of formaldehyde the maximum value reached was 0.02 ppm in the air, well below the ACGIH ceiling value of 2 ppm. The formaldehyde in a typical acrylic resin when it is purchased by the art material manufacturer is about 2 ppm. and after addition of pigment and additives it may be around.7 parts per million, unless the manufacturer adds more formaldehyde in his formulation. The manufacturers we have talked to use a different preservative.

Most people handle these paints with no problems, however individuals who have become sensitive to formaldehyde from some other exposure can have a violent reaction. I have had painting students who had gone through nurses training and

could not come near acrylic paints and I have a friend who became very ill in a room which had just been painted with a vinyl emulsion paint.

Many other products contain formaldehyde, the glue in boxes, cigarette smoke, automotive exhaust, foam insulation, permanent press fabrics even shampoo and cosmetics. Three things are needed, one is to keep the formaldehyde level as low as possible in our environment, another is to list the formaldehyde on products that contain it whenever this would enable allergic individuals to avoid the product. It is now listed on the labels of cosmetics, but not on the labels of paints. The third need is for further investigation to determine if at low levels formaldehyde is a carcinogen, or teratogen, or presents other chronic toxicity hazards.

I have described the situation regarding two paint ingredients which are candidates for consideration as chronically toxic by the Consumer Product Safety Commission (CPSC) under H.R. 6977, because it is only in looking at some details that an idea can gained about the complexity of the situation and how legislation might affect it. It seems to me that the evidence concerning both of these ingredients is so contradictory that no determination of chronic toxicity could be made by the CPSC without a program for independent long term testing. Most of the other ingredients in artists' paints which have been questioned, including almost all of the pigments in Attachment 4 would have to have similar investigation.

In my view, HR 6977 would result in the forseeable future in a very few substances being labeled as chronically toxic. CPSC may already have the authority to require such labeling on these proven hazardous substances. Unless money is appropriated to finance extensive studies, the majority of substances about which questions have been raised will continue with no warnings other than those to which manufacturers will agree. My experience is that in a cooperative setting where all interests are represented, such as ASTM D01.57, agreement can be reached with a minimum of expense, although participation and advice would be needed from the CPSC based on further studies. In other words, the old voluntary standards system can do as well if there are some firm impartial data available.

H.R. 6977 also mandates that "all labels of products containing substances that cause chronic or acute illnesses have: (a) a description of the physical side effects that could result from the misuse of the product, (b) a description of how to counteract the possible side effects resulting from

misuse of the product; (c) a description of the proper precautionary measures to avoid misuse; and (d) instructions for safely disposing of the product...."

Many common substances can be misused in such a way as to become toxic. You can eat enough salt to kill you. It would be impossible to think of all the ways a substance might be abused, what side effects such abuse might cause, and how to counteract the physical side effects. It is reasonable to require that the most likely methods of use be considered and that poison centers be provided with detailed information necessary to deal with unusual occurances.

The prospect of having instructions on a 5.3 ml. tube of paint telling how to dispose of it safely is not practical. There are substances dangerous enough in the environment to require such precautions and a few, such as strong acids, are used in the arts, but most art materials do not require such instructions.

In summary, there are health problems connected with the use of a number of art materials and there are a few which call for extensive labeling in order to be used and discarded safely. Most materials, even among those most criticized, call for less drastic but more comprehensive methods. This would include: (1) requiring a list of the major ingredients on the label including, in the case of paints, any pigments and preservatives; (2) use of a series of graded symbols, similar to those developed in England and coupled with a brief text; (3) manufacturers would be required to furnish poison centers with more complete information; (4) in the few cases where disposal poses a serious environmental hazard, instructions for disposal should be required on the label.

Among the symbols should be one which indicates that a substance is suspected, based on standard tests, of being chronically toxic. This symbol if used nationwide, or internationally, would alert users to handle the material with care long before final proof could be obtained. Upon proof the symbol could either be dropped or a symbol indicating stronger warnings be substituted. The argument against this use of a symbol is that widespread doubt would be cast on substances which later proved harmless. The answer to this is that is already taking place. Pressure from the market place has caused manufacturers to put warnings on paints they really believe are harmless.

Symbols catch the attention of the consumer much more quickly than a long text. The accompanying short text should indicate what precautions should be used and what remedies are appropriate in case of an accident.

I believe this approach would result in more substances being labeled for hazards and therefore more information for the artist than H.R. 6977 will provide in its present form. As a representative of Artists Equity Association I am eager to see the maximum amount of hazard information made available to the artist. Artists Equity is also interested in the durability and expense of the materials. These three interests must all be kept in mind in planning legislation for artists' benefit.

ATTACHMENTS TO
WRITTEN TESTIMONEY ON H.R. 6977
BY JOY TURNER LUKE, ARTISTS EQUITY ASSOCIATION

FROM INTERVIEW WITH JENNIFER DICKSON BY LYNN CUMMINGS ©
"INTERVIEWS WITH NINE CONTEMPORARY ARTISTS" NATIONAL GALLERY OF CANADA

ATTACHMENT 1

so few in number. This summer I should get him to test the watercolour papers I am working with.

L.C. Do you think these facilities are available to most artists?

J.D. I think that most serious artists, as long as they're prepared to give the lab at the Gallery enough time, would find a collaboration on any research they wanted; any tests they wanted to run. I think these resources are available if they care to use them.

L.C. What problems have you encountered with the materials you use, other than the ones you have already mentioned?

J.D. Just going back to paper for one moment, I started, last year, to work with colour xerox. That's a new development for me and I was very dissatisfied with the paper support that most people are using for xerox. I spent three months last summer doing research into various kinds of archival supports for colour xerox and after laying out a lot of money in terms of research, I have been able to come up with a support that I am satisfied with in that regard.

→ The main problems I have encountered in terms of other materials is the ingestion of fumes from acids and solvents which have completely destroyed my lungs. The chemical that I can personally talk about is nitric acid. What it does is to destroy the capillaries in the lungs so the lungs are no longer functioning at a full capacity, you're not able to get the amount of oxygen you should be getting. There is no way that your breathing facility can be restored to you. I'm not alone in this kind of chronic lung condition. Many printmakers of my generation are now showing signs of this. That's not a problem I can do anything about now, it's a medical problem, I now have to live with it. My lungs are permanently damaged and I am no longer able to work as an etcher. In other words, I have spent twenty years perfecting my art and I'm no longer able to use that expertise because even very short exposure to these chemicals makes me very ill. In January at the Cincinatti Art Academy I gave a demonstration on photo-etching. I came home and was seriously ill for a month after having done that for three days, that was the price I paid and that brought home the fact that I can no longer work in that technique.

I would say that most schools have a criminally negligent attitude toward safety standards within the working environment for their students and their faculty. I have been very vocal in this regard, and in a number of cases where I have complained, those complaints have been dealt with seriously. For instance, the entire ventilation system in the print department at Queen's University in Kingston was rebuilt at a cost of twelve thousand dollars, after I had proved to them that what it was doing was circulating highly toxic fumes. The Saidye Bronfman Centre in Montreal rebuilt their exhaust system in the etching room after I and two other students became quite seriously ill. It normally seems to take some kind of medical emergency before schools are prepared to deal with it seriously and most schools aren't. The primary reason for this is

the cost factor. I don't think the administration quite understands the seriousness of the medical consequences. I think it needs one artist to sue a university. I'm sorry, in a way, that I didn't take legal action against the Bronfman Centre, I would have had a very good legal case, but I'm not that kind of person. I do think that one case like that on the books would serve to change the attitudes right across the country.

L.C. Has this come about because you didn't know about the dangers involved with working with these chemicals?

J.D. It's because, where extraction facilities existed in almost every studio I worked in in Canada, they were grossly inadequate and poorly designed. Other artists who are suffering very badly in this regard are people who are working with silkscreen and that is caused by lacquer thinner and various solvents. For instance, at the University of Wisconsin, we had students suffering from peripheral blindness as a result of the ingestion of lacquer thinner. One thing I'm learning as I speak to different doctors and specialists is, it affects people in different ways and the older you become, the more your tolerence to these kinds of toxins breaks down. So, these signs, the warning signs are not always recognized for what they are and the doctors treat them as symptoms of other things. There's not enough medical evidence put together yet for doctors to be able to recognize early on what the symptoms are pointing to. It's a very serious problem and I think it is one that has to be tackled at a serious level by the schools and institutions and one reason they are reluctant to tackle it is the cost factor. They do not come under the Industrial Safety Standards Act and if they did, their answer would be, well, they couldn't afford to run the labs. I find that hypocritical because biology labs, science labs, labs in physics departments do come under these standards and I think this has to be dealt with, perhaps it has to be legislated.

L.C. What kinds of information are being circulated about this problem?

J.D. There are two brochures, there's the American one, "Health Hazards for the Artist" and there's a very good one that come out of the Alberta College of Art, which was funded by the Alberta Ministry of Culture. As far as I know, those are the only two. I have been collecting information and the Safety Department at Queen's University did feed me some very interesting information. Also, I've obtained some information from my doctor. I think that all professors have a moral responsibility to their students to give them information on the materials that they are using and to point out the hazardous nature of them and to enforce safety precautions. I found that Queen's had a very supportive chairman and we enforced safety standards right across the board, including the Sculpture Department, where they were being incredibly negligent until they had a very serious accident and that smartened them up. I feel the enforcement of these standards should be a priority in all teaching establishments.

CANADIAN SYMBOLS

SCHEDULE A

Degree of Hazard	Symbol — Symbole	Degré du risque
1. Danger		1. Danger
2. Warning		2. Avertissement
3. Caution		3. Attention!

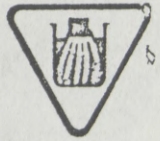
SCHEDULE B

Nature of Primary Hazard	Symbol — Symbole	Nature du risque primaire
1. Poison		1. Poison
2. Corrosive		2. Corrosif
3. Flammable		3. Inflammable
4. Explosive		4. Explosif

SCHEDULE C

"Ratio of Size of Nature of Hazard Symbol to Degree of Hazard Symbol"

Rapport entre les dimensions des symboles de la nature du risque et celles des symboles du degré de risque

	Poison / Poison	Flammable / Inflammable	Explosive / Explosif	Corrosive / Corrosif	
Danger					Danger
Warning					Avertissement
Caution					Attention!

STATUTORY INSTRUMENTS
HEALTH AND SAFETY
THE PACKAGING AND LABELLING OF DANGEROUS SUBSTANCES
REGULATIONS 1978

Regulation 5 (1) (c)

SCHEDULE 2

Indication of General Nature of Risk

Toxic

Corrosive

Harmful

Highly Flammable

Irritant

Explosive

Oxidizing

The above symbols shall be in black on an orange-yellow background.

List for toxicity evaluation

Pigments which have been listed somewhere as having some hazard connected with their use.

1. Nickel Titanate Yellow, PY 53 (77788) calcined nickel carbonate, antimony oxide, and titanium dioxide

2. Flake White, PW1 (77597) basic lead carbonate

3. Cerulean Blue- some types of this pigment contain chromium

4. Cadmium Pigments- Cadmium Orange, PO20(77196) cadmium sulfide or selenosulfide, either concentrated or coprecipitated with barium sulfate
Cadmium Reds, PR108(77202), cadmium sulfoselenide, either concentrated or coprecipitated with barium sulfate.
Cadmium Yellow Light, PY 37 (77199) cadmium sulfide either concentrated or coprecipitated with barium sulfate
Cadmium Yellow Medium or Deep, PY35, cadmium sulfide either concentrated or coprecipiated with barium sulfate.

5. Cadmium Mercury Pigments: solid solutions of HgS in CdS with formula CdS-xHg.S.
Cadmium Mercury Orange, PO 23 (77201), cadmium mercury sulfides either concentrated or coprecipitated with barium sulfate.
Cadmium Mercury Red, Light, Medium, Deep, PR 113 (77201), cadmium mercury sulfide either concentrated or coprecipitated with barium sulfate.

6. Chromium Oxide Green, PG 17 (77288), anhydrous chromic oxide, Cr_2O_3.

7. Vermilion, PR 106 (77766), mercuric sulfide, HgS.

8. Zinc Yellow, PY 36 (77955), hydrated zinc potassium chromate $ZnO \cdot K_2CrO_4 \cdot H_2O$

9. Viridian, PG 18 (77289) hydrous chromic oxide $Cr_2O_3 \cdot 2H_2O$

10. Raw and Burnt Umber, NBr7(77491) hydrous silicates and oxides of iron manganese. Calcined for Burnt Umber.
Zinc White - some lead

11. Cobalt Violet, PV14 (77360), anhydrous cobalt phosphate $Co_3(PO_4)_2$ or $Co_3(PO_4)_2 \cdot 4-8H_2O$. There is an arsenate variety of this pigment (77350) $Co_3(AsO_4)_2 \cdot 8H_2O$. We don't believe this is still on the market, but it may be.

12. Hansa Pigments: There are a number of these pigments used. They are substituted anilines that have been diagotized and coupled either with arylamides of acetoacetic acid or with pyrazolone. Other names: Permanent Yellow, Yellow Toner, Monofast Yellow, and Toluidine Yellow. The toluidine yellow arises from the fact that m-nitro-p-toluidine is the "aniline part" of both the Toluidine Red and the Hansa Yellow G molecules.

13. Lamp Black, PBk(77266) amorphous carbon made by condensing soot from a luminous flame.

14. Ivory Black, PBk9 (77267), amorphous carbon made by charring animal bones.

15. Manganese Blue, PB33(77112), barium manganate with barium sulfate $BaMnO4:BaSO4$.

16. Manganese Violet, PV16 (77742), manganese ammonium phosphate, $NH_4MnP_2O_7$.

17. Nickel-Azo Yellow, PG10 (12775), A nickel-chelated, azo yellow derived from parachloraniline and 2,4-dihydroxyquinoline. $C_{30}H_{18}O_4N_6Cl_2Ni$.

18. Phthalocyanine Blue PB15 (74160) $C_{32}H_{16}N_8Cu$ and Phthalocyanine Green PG7(74260). We have heard there may be some hazard here if these pigments are not washed thoroughly.

19. Strontuim Yellow PY32 (77839) Strontium chromate, $SrCrO_4$.

20. Chrome pigments: These are lead chromate pigments. We don't believe these pigments are in American made artists paints, but they may be in European paints.

21. Chrome Yellow, PY34 (77603) Primrose 3.2 $PbCrO_4 \cdot 1PbSO_4$
Light or Lemon 2.5 $PbCrO_4 \cdot 1PbSO_4$
Medium $PbCrO_4$

22. Chrome Orange, PO 21 (77601) Light to extra Deep $PbCrO_4 \cdot PbO$

23. Diarylanilide or Benzidine Yellows, PY 12 and 13

24. Dinitroaniline Orange, PO 5 (12075) $C_{16}H_{10}N_4O_5$

25. Pyrazolone Orange and Red, PO 13 (21110) and Diarylide Orange and Red, PR 38

26. Para Red, Paranitroaniline Red, PR 1

27. Toluidine Red, Hansa Red, PR 3 (12120) $C_{17}H_{13}N_3O_3$

28. Lithol Red, PR 49

29. Red Lake C, PR 53 (15585) $Ba(C_{17}H_{12}N_2O_4\ Cl_1S_1)_2$

30. Scarlet Lake, PR 60 (16105)

31. Rhodamine 6B, PR 81

32. Rhodamine B, PV 1

33. Victoria Pure Blue B, PB 1

34. Victoria Blue B, PB 2

35. Brilliant Green, PG 1 or 2

Other titles in the series:
Cadmium production, properties and uses
Cadmium in alloys
Cadmium coatings
Cadmium in stabilizers for plastics
Cadmium in batteries

Cadmium Association
34 Berkeley Square, London W1X 6AJ
Telephone 01-499 8425 Telex 261286

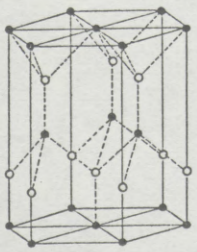
Cadmium Council
292 Madison Avenue, New York, NY10017
Telephone (212) 679-6020 Telex 148320
Published 1978

Technical notes on cadmium
Cadmium pigments

Introduction

Cadmium pigments are stable inorganic colouring agents which can be produced in a range of brilliant shades of yellow, orange, red and maroon. Their greatest use is in plastics, but they also have significant application in some coatings and ceramics.

The pigments are based upon the compound cadmium sulphide which produces a golden yellow pigment. Partial substitution of cadmium by zinc or mercury and of sulphur by selenium in the crystal lattice (see Fig. 1) forms a series of inter-crystalline compounds making up the intermediate colours in the lemon yellow to maroon range of cadmium colours. The pigments are fine discrete particles of coloured powder with diameters of round 1μ. They are distributed and suspended in the material to produce a uniformly coloured product.



○ cadmium (zinc, mercury)
● sulphur (selenium)

Fig. 1 Hexagonal crystal structure of cadmium pigment

Naturally occurring cadmium sulphide is the bright yellow mineral greenockite and this was used by artists as a yellow colouring 2000 years ago. In the nineteenth century cadmium sulphide and cadmium sulpho-selenides were synthesized in Germany to produce a range of yellow to red pigments for artists colours. Developments in these pigments led to wider use and to formulation of cadmium lithopones (cadmium pigments diluted with 'blanc fixe' – barium sulphate). A shortage of selenium in the early 1950's led to the discovery that mercury sulphide could be substituted for cadmium selenide in the orange to maroon range of the pigment.

Western World use of cadmium in pigments is about 3,500 tonnes per year, about 25 per cent of cadmium consumption. Despite intensive developments in a very competitive market, cadmium pigments have maintained their technical superiority in applications such as plastics and ceramics and have significant use in some industrial coatings.

Advantageous properties

The main advantage of cadmium pigments are:

(i) High temperature stability.

(ii) Wide range of brilliant colours.

(iii) Insoluble in organic solvents, i.e. 'non-bleeding'

(iv) High resistance to chemical attack

(v) High resistance to degradation by light

(vi) High opacity

(vii) Good resistance to colour particle migration

(viii) Good dispersion characteristics in plastics and paints.

No other yellow, orange or red pigment can reliably provide all these properties, particularly for use in higher temperature processing (up to 500°C).

Colour range

Basic cadmium colours range from yellows with the sulphide to deep maroons with the selenide. Cadmium sulpho-selenide pigments provide the intermediate colours comprising darker yellows, oranges, reds and maroons. Greener shades of yellows – lemons and primroses – can be obtained by partial substitution of cadmium sulphide by

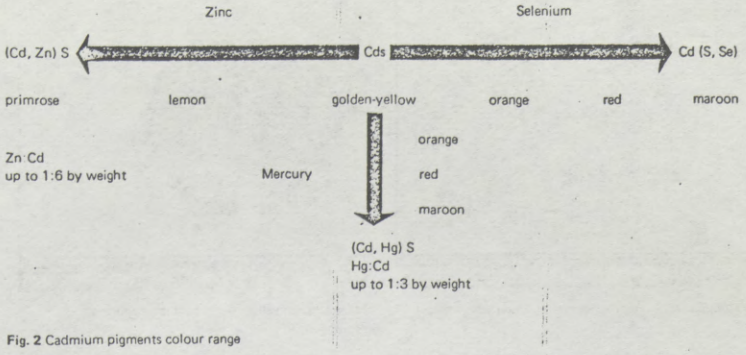


Fig. 2 Cadmium pigments colour range

zinc sulphide (see Fig. 2). Mercury can be added to produce cadmium-mercury sulphides which have orange and maroon colours similar to those obtained from cadmium selenides, but which are not as stable at higher temperatures. Barium sulphate is added to produce 'extended' pigments and the addition of titanium dioxide provides opacity and tint shades of pigment tone. Cadmium pigments can also be mixed with others to produce greens and browns.

Production

Individual pigment manufacturers have developed various proprietary methods of obtaining particular colours and properties. However, these methods are usually variations on a single standard process.

The starting materials are usually pure solutions of either cadmium sulphate or cadmium nitrate. These are either bought in bulk or made in the factory from cadmium or cadmium oxide and the appropriate acid. An aqueous solution of sodium or another alkali sulphide is then mixed in carefully controlled quantities with the cadmium sulphate solution to precipitate cadmium sulphide in cubic crystallographic form. Cadmium sulpho-selenides are produced by mixing cadmium sulphate with an alkali sulphide-selenide.

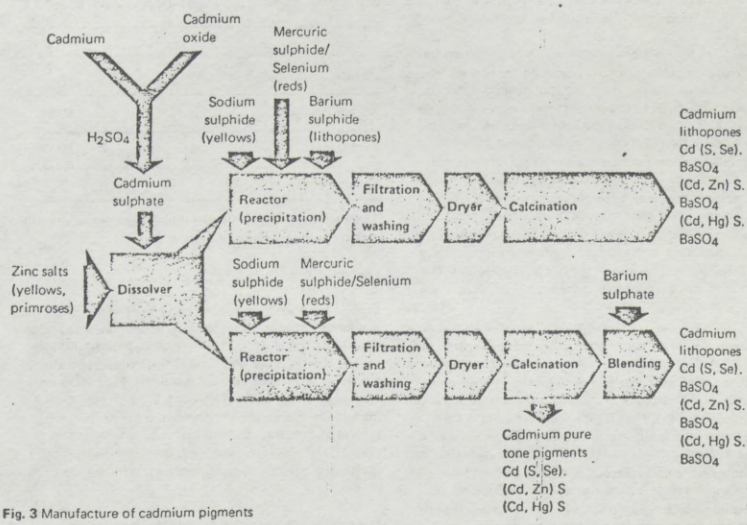
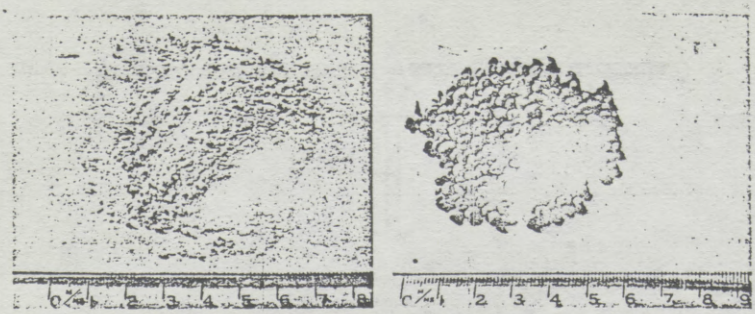


Fig. 3 Manufacture of cadmium pigments



a) Homogeneous pure pigment in dry powder form

b) Master batch pellets — pigment pre-dispersed in compounded polymer resin

Fig. 4 Examples of cadmium pigment products. (Photos: Courtesy of Blythe Colours Ltd.)

In an alternative route, which is not commonly employed, a cadmium carbonate slurry is used and mixing with sodium sulphide will again precipitate cadmium sulphide.

After washing and drying, the precipitates are very fine coloured particles but have no pigment properties. The true colours of the pigments develop during calcination (roasting) at 550 to 650°C when the cadmium pigment material is converted from the cubic (zinc blende) to the more stable hexagonal (wurtzite) crystal structure. After calcining, the pigments are flushed with 0.1 N hydrochloric acid (similar to gastric acids) to remove more than 99.9 per cent of the soluble cadmium and then again washed and dried in filter presses. The pigment emerges as a filter cake which is disaggregated for despatch or further processing.

Cadmium pigments can be used in this concentrated form as well as in extended form as cadmium lithopones. Cadmium lithopones, which incorporate inert 'blanc fixe' (barium sulphate) can be produced by two methods (see Fig. 3). The first involves the mechanical blending of the barium sulphate with the cadmium pigment after calcining. Barium sulphate has similar particle size and specific gravity to the cadmium pigment and mixes well. The alternative route involves the addition of the barium at a much earlier stage to give a more efficient mix. Barium sulphide is added to the cadmium salt solution instead of some of the sodium sulphide. Barium sulphate is then co-precipitated with the cadmium sulphides. The entire co-precipitate is then calcined.

The final pigment is a homogeneous powder with a typical particle size of 1μ (commercial pigments have a range of 0.1 to 3.5μ). The opacity and tinting strength of the pigment is a function of the particle size and maximum strength is obtained at a particle size equal to half the wavelength of the incident light. Thus for the cadmium colours the desirable particle sizes range between 0.25μ for the yellows and 0.30μ the reds. Experiments have been carried out to produce more homogeneous colours by calcining the pigment in a molten alkali halide. The aim has been to develop a uniform particle size which would be closer to the ideal for a particular colour but the process is not economic at present.

Cadmium pigments are usually sold as a powder for many applications but they can be supplied in other ways. For the plastics industry they can be processed into convenient predispersed forms, such as master batch pellets (pigment incorporated in pellets of compounded polymer resins), paste concentrates and liquid colour, which allow the pigment to be added to resins at different stages of the plastics manufacturing process. (See Fig. 4 a,b).

Applications

The consumption of cadmium pigments amounts to about 8,000 tonnes each year (containing 3,500 tonnes cadmium) and this can roughly subdivided by industry as follows:

	Percentage
Plastics	75
Surface coatings	10
Ceramics	10
Miscellaneous	5

There are, however, substantial differences from country to country in the relative percentages.

Plastics

Cadmium pigments are used in many types of thermoplastic and thermoset plastics. An estimate of their use is at Fig. 5 They will disperse easily into the resin to provide uniform colouring with high opacity and tinting strength and after processing will be suspended and sealed within the plastic matrix and so will be non-migrating. The pigments are insoluble in organic solvents (hence will not 'bleed') and, in most plastics, have good resistance to detergents and the action of most corrosive alkali chemicals. In most cases cadmium pigments will remain colour fast for the life of the plastic.

The most important property of cadmium pigments, however, is their heat stability. Engineering plastics, such

Plastic	Percentage
ABS	35
High-density polyethylene	25
Polypropylene	15
Low density polyethylene	10
Styrene	10
Others including PVC	5

Fig. 5 Estimate of use of cadmium pigments in various types of plastics

as ABS (acrylonitrile – butadiene sytrene), nylon, fluorocarbons and polycarbonates, and some other thermoplastics, such as polystyrene, polypropylene and high density polyethylene (HDPE), are processed at temperatures ranging up to 400°C. These temperatures are far higher than those recommended for most organic pigments and hence a plastics manufacturer must choose an inorganic pigment. With a limited selection of inorganic pigments available in this colour range the choice of a cadmium pigment becomes mandatory. This high heat stability makes them the only choice for colouring engineering plastics such as polycarbonates and nylons whose products may also have to withstand service temperatures up to 150°C. The heat stability is also useful in allowing repeated in-factory recycling of scrap plastic materials, containing valuable cadmium pigments, which have been subject to the high temperature processing.

Their dispersion, non-migration and non-bleeding properties made cadmium pigments useful in synthetic leathers and other plastic sheet applications where even colouring is important. The superior dispersion characteristics of cadmium pigments compared with organic pigments are especially useful in injection moulding of plastics as the colours will rapidly and evenly spread in the moulding process without requiring prior mechanical blending.

Despite cadmium pigments being the most expensive inorganic pigments for plastics, they represent very good value in that their high opacity and colouring power mean only small amounts are required to colour resins. Pigments are added to plastics in proportions of less than one part per hundred resin (phr) and 1.5 per cent by weight and as resins themselves are often expensive the pigment may not be a major factor in the final product price.

The high price of cadmium pigments has already resulted in replacement in plastics where alternatives exist but further substitutions is unlikely. The trends towards achieving higher mechanical strengths and working temperatures in engineering plastics may result in an increased demand for cadmium pigments in the plastics industry.

No commercially available yellow-orange-red inorganic or organic pigments can be considered as all purpose alternatives to the cadmium pigments. The chrome yellows and molybdate oranges can match some of the cadmium colours but do not have the heat and light stability of the cadmium pigments and are more difficult to use in ABS, nylon and polyethylene resins. With notable expensive exceptions, most organic pigments cannot be used with acrylic, polycarbonate, polypropylene and nylon resins.

Surface coatings

Bright cadmium yellows, oranges and reds are major pigments for artists colours where their performance and opacity are the accepted standards against which other pigments are judged. The broad range of bright colours and the good colouring power of cadmium pigments gain them wide application in many surface coatings. Cadmium yellows and reds can have service temperatures well above 300°C and are used for painting pipes for steam and process chemicals. They are also used in coatings for processing plants where their good resistance to chemical attack, particularly from alkalis, can prolong the life of the coating.

Cadmium pigments can be incorporated in many latex and acrylic coatings and are often used to colour motor vehicles finishes. They are generally not suitable for many other exterior coatings because of their sensitivity to some combinations of exposure and moisture.

Cadmium pigments are usually incorporated in paints in proportions of 10 to 15 per cent by weight.

Regulations in some countries limit the use of cadmium pigments in paints for toys.

Ceramics

The unique abilities of highly stable cadmium pigments to withstand high processing and service temperatures make them the only choice in this colour range for glasses, ceramic glazes and vitreous enamels.

In transparent glasses, the cadmium pigment particles are colloidally dispersed to produce colours by selective absorption and scattering. Cadmium colours in a cooled glass are only very faint and require heat treatment, called 'striking', to bring out the full intense colours. The addition of 0.5 per cent by weight of cadmium pigment produces bright transparent glasses with colours ranging from intense yellow through to ruby red depending upon the cadmium sulphide and selenide ratio. A ruby red produced from a selenium to cadmium sulphide ratio of 1:2 has excellent light transmission in the red part of the spectrum with a sharp cut-off of other colours. Selenium rubies of this type are used to colour glasses for standard signal lamps for railway, marine and other uses.

Greater proportions of cadmium pigments (up to about 10 per cent) with a cadmium oxide stabilizer are employed to make darker decorative glasses.

The bright colours of cadmium pigments are ideally suited to ceramics (wall and floor tiles, practical and decorative pottery etc.).

Vitreous enamels for glass (such as for permanent labelling on returnable bottles) and porcelain enamels for external coatings on iron and steel kitchenware (ovens and cookware)

contain cadmium pigments to give red, orange, yellow and lemon-green colours which will withstand high processing and service temperatures.

Miscellaneous uses

Cadmium pigments have a number of other important uses in rubber, paper and inks although these uses are small in terms of cadmium consumption.

The properties of cadmium pigments are well suited to their use in some rubber products such as flooring. Thermal stability and chemical resistance ensure colour fastness and the pigments are unaffected by hydrocarbon solvents and detergents. Silicone rubber cable insulation subject to high temperatures in processing also requires the thermal stability of these pigments to ensure colour fastness for reliable colour coding of cables.

The chemical and thermal stability of cadmium pigments together with their light fastness, are especially suited to colouring the base pattern paper of cellulose based decorative laminates used on kitchen work surfaces and walls. Cadmium pigments are also used in formulating the insoluble stable inks used in producing the decorative patterns without colour 'bleed'.

Cadmium pigments also colour some printing inks, cosmetics (nail pollshes and face powders) and some leather finishes.

Health aspects

There is often public concern that many materials used today in processing and products can affect the environment inside and outside the workplace.

Certain forms of cadmium or its compounds have solubilities and effects which in some circumstances can be hazardous to the respiratory systems of workers. Cadmium sulphide and sulpho-selenide pigments, however, are considered relatively insoluble in body fluids in the respiratory system and elsewhere but biologically soluble and respirable fractions of dusts of these pigments should nevertheless be kept within the working atmosphere limits of national safety standards set to cover more active cadmium compounds. Medical evidence has indicated that the biologically insoluble and nonrespirable fractions of the dusts of these pigments present an even lesser hazard but their levels should be kept within the standard levels for nuisance dusts.

Ingestion of biologically insoluble pigments presents little or no risk of systemic absorption.

The relative insolubility and non-migrating character of cadmium pigments and their low concentrations within products such as plastics, paints and ceramics mean that in most situations encountered in everyday life these products are not hazardous sources of cadmium.

VERBAND DER MINERALFARBENINDUSTRIE E.V. (VDM)

ATTACHMENT 6

The safety of cadmium pigments

It was under this heading that the trade press (1) in 1976 reported on the results of research based on subchronic toxicological experiments (2). It was noted at that time that extensive long term tests were being undertaken with the aim of obtaining further evidence to support the initial findings. The results of this research are now available, an interim report having been submitted during the First International Cadmium Conference 1977 in San Francisco (3). A report on the final results was given at the Second International Cadmium Conference in Cannes from 6th-9th February, 1979. They are to be published during 1979 in the journal "Toxicology".

The research was carried out at the Bayer Institute of Toxicology, Wuppertal, the histology at Hazleton Laboratories Europe Limited, Harrogate, U.K.

The experimental animals (Wistar rats) were given 1, 3, 10 and 50 ppm of soluble cadmium in the form of cadmium chloride ($CdCl_2 \cdot H_2O$) with their feed for a period of two years. This was equivalent to a cadmium intake of about 50 mg/kg body weight for the lowest dose level and 2,500mg/kg body weight for the highest level throughout the period of the experiment. Comprehensive pathological and histological tests were carried out during and after the two year period. Special attention was given here to those areas where statements made in literature gave grounds for suspicion that damage might be caused by prolonged intake of cadmium.

It was established that a dose of up to 10 ppm cadmium was tolerated without any damage. The administration of 50 ppm cadmium led to a slight reduction in the body weights of the male animals and certain effects in the kidneys of both sexes, though there was no increase in mortality.

In none of the dosage categories was anything found to indicate that cadmium causes hypertension, despite the long feeding period and the very large amount of cadmium ingested. This finding conflicts with a number of statements made in literature. Schroeder (4), for exemple, claims to have found high blood pressure in rats whose drinking water contained a concentration of 5 mg cadmium per litre. In the meantime, however, other articles have appeared in literature (e.g. 5) in which it has not been possible to confirm that cadmium increases the blood pressure. Furthermore, new studies, especially in the epidemiological field, which were discussed during the Second International Cadmium Conference in Cannes, have confirmed that there is no correlation between hypertension and cadmium resorption.

The autopsy and subsequent macroscopic pathological findings based on the examination of rats which died or which were killed at the end of the experiment period yielded results as for untreated animals in all the dose categories. The same is true of the histopathological examination carried out on a total of 24 organs. The type, localization and frequency of neoplastic tissue did not indicate any carcinogenic effect of cadmium up to and including the 50 ppm dose level. This confirms what is said in the IARC Report (6), i.e. that at least in the case of oral intake, there is up to now no indication that cadmium might be carcinogenic.

The cadmium content in the kidneys and liver determined analytically depended on the dosage.

The research findings are therefore in line with the results of the subchronic feeding experiments, in which rats and dogs tolerated a dose of 30 ppm cadmium without damage.

Cadmium was also investigated for its effect on the reproductive performance through 3 successive two-litter generations at diatory-levels of 0, 1, 3, 10 and 100 ppm Cadmium as $CdCl_2$. There were no effects on fertility, viability and lactation indices in any of the groups.

No histological changes were found in the treated rats compared with the control group.

All these comprehensive experiments confirm that the toxicity of cadmium varies distinctly according to the route by which it enters the body. The research carried out shows that considerably higher oral doses of cadmium can be ingested without damage than had been assumed on the basis of injection experiments described in literature.

In the light of these results, a re-assessment is needed of possible hazards arising from the widespread use of products containing cadmium, and in particular of materials coloured with cadmium pigments.

Does the use of these products give rise to any ingestion of cadmium, and if so, can the quantities concerned be regarded as anything but completely safe in view of these new experimental findings?

Approximately 80 % of all cadmium pigment production is used in the plastics industry, 10 % in the surface coatings industry and 10 % as colourants for ceramic products (7).

soluble in 0.1 N hydrochloric acid is limited to less than 0.2 %. In fact most cadmium pigments today contain less than 0.1 % cadmium soluble in hydrochloric acid (DIN 53 770), thus complying with the purity requirements for colour pigments for special applications in countries such as France, Spain and Belgium. If a dose of 10 ppm soluble cadmium in the feed is tolerated without effect, a similar test with cadmium pigments should show a tolerance of something like 10 g pigment per kg of feed without damage. Acute toxicity measurements confirm this reasoning. The LD 50 of cadmium chloride is 302 mg/kg (3), whilst that of cadmium pigments is over 10 g/kg.

Extensive research has been carried out on the possible migration of cadmium from cadmium-pigmented plastics, and some of the results published (8,9). These show that the amounts of cadmium capable of migrating even under extreme conditions cannot have any toxicological significance in the light of the research findings described above.

In the tests to investigate migration from plastics, only microgram levels of cadmium were found, calculated on the surface area of a 1 litre container, and the only reason it was possible to measure these amounts analytically at all was that an extremely long contact period of 10-30 days had been used. In practice, short-term contact for between a few minutes and a few hours is usual, and it is then virtually impossible to detect any migration of cadmium, even when such tests are carried out with acetic acid, the most aggressive food simulant. There is therefore no justification for speaking of a health hazard when cadmium-pigmented plastics are used in articles which may come into contact with food.

It is often claimed that toys made of cadmium pigmented plastics present a hazard. In fact it can be stated categorically that cadmium pigmented plastics toys cannot possibly contribute to the daily cadmium intake because no measurable increase in that intake can be detected as a result of sucking or even swallowing a toy.

As regards the use of cadmium compounds in the ceramics field, an EEC Draft Guideline has now been drawn up to regulate, among other things, cadmium migration from ceramic products in the light of technological and toxicological considerations.

For some time now, discussion of the possible dangers from exposure to cadmium has been shifting from the improbable direct contamination from plastics and surface coatings containing cadmium to the indirect hazard arising from the disposal of refuse and, in particular, from refuse incineration. Such fears are based on the assumption that as a result of combustion the cadmium contained in plastics is emitted into the environment and contributes in the long term to an increase in the level of cadmium present in foodstuffs.

Detailed investigations and estimates of cadmium emissions in the Federal Republic of Germany have shown that even under extreme conditions – basing cadmium emissions from plastics on the quantity of cadmium compounds used in plastics in one year – the pollution load is only about 1 % of the total load from all the emission sources (10). As these figures are based on extreme conditions, the actual contribution made by plastics to total cadmium emissions from the various sectors would be only about half as great. These figures for the Federal Republic of Germany are likely to be roughly the same for other industrialized countries.

It would seem essential that a more objective approach be brought to the question of the use of cadmium pigments and cadmium-based stabilisers, so that the important new evidence here reported can be properly weighed and considered. Restrictions or even bans on products which contain cadmium would not lead to any reduction in hazard, since the hazard from handling or disposing of these products is shown to be insignificant. On the other hand, the cost of imposing such restrictions, would be considerable technical disadvantages in both the colouring and stabilisation of many plastics. This cost is so out of proportion to the insignificant benefits that such measures cannot be justified.

Karlstraße 21, Frankfurt, June 1979

Literature

1) cp. e. g. defazet 1/1977, p. VII; Europa Chemie 21/1976, p. 381; Farbe und Lack 11/1976, p. 1089; Ned. Chem. Ind. 18/1976, p. 501

2) E. Löser and D. Lorke, Toxicology (1977) p. 215-232

3) D. Lorke, edited proceedings, 1st Int. Cadmium Conference, publ. by Metal Bulletin, p. 175-179

4) H. A. Schroeder and W. H. Vinton, Am. J. Physiol. 202 (1962), p. 515-518

5) K. Ostergaard, The Lancet 26 (1977) p. 677

6) IARC Monographs (1976), p. 53 ff

7) H.-J. Wienhenkel, edited proceedings, 1st Int. Cadmium Conference, publ. by Metal Bulletin, p. 14-15

8) D. Rade, dto., p. 13-14

9) H. Endriß, Deutsche Lebensmittelrundschau, 70 (1974), p. 243-247

10) Bericht 4/77 of the Umweltbundesamt "Luftqualitätskriterien für Cadmium", p. 30 and 32.

BAYLITH COLOURS LIMITED

THE CASE FOR THE CONTINUED ACCEPTANCE OF

CADMIUM PIGMENTS

Cadmium was first isolated by Strohmeyer in 1817 and Cadmium Sulphide, its most characteristic compound and the basis of all Cadmium Pigments, was first recorded by Gay Lussac who prepared it by precipitation from solutions of Cadmium Salts with Hydrogen Sulphide.

Cadmium Sulphide also occurs naturally in small quantities as Greenokite and was used over 2000 years ago by artists and painters. Nowadays it is little used and pigments are prepared from solutions of Cadmium and Selenium Salts followed by calcination at elevated temperatures. Their manufacture has steadily increased and improved during the last 40 years as a result of similar development of the plastics industry - their main outlet.

As major manufacturers we have been aware for some time of the increasing doubts that have been expressed concerning the safe use of Cadmium Pigments for the colouring of plastics. The knowledge that some Cadmium Salts are toxic has led to the belief in some quarters that Cadmium Pigments are also toxic.

Firstly it can be said that there is no evidence - direct or indirect - of any harm arising from the manufacture or use of Cadmium Pigments. It makes no sense therefore to class Cadmium Pigments with other Cadmium compounds or alloys for which the risks are clear and case histories offer proof.

Secondly, in addition to the negative historical evidence, results of two studies offer support that no harm is likely to arise in the future from the use of Cadmium Pigments and from this it follows that their use should be permitted.

1. A programme of work has been sponsored by a group of European Cadmium Pigment manufacturers under the auspices of the Verband der Mineral farben-industrie E.V., since no previous work had been done which gave any clear indication of the tolerance of animals to Cadmium when added to foodstuffs in known quantities.

   The Bayer Institute are carrying out the work and have conducted a toxicological study using Cadmium Chloride to establish a "no effect level" of Cadmium ion when added directly to foodstuffs.

The results, when quantities up to 30 ppm of soluble Cadmium were directly added to foodstuffs over a feeding time of three months, revealed no discernible change in animal subjects.

The programme is continuing.

All commercially available Cadmium Pigments are manufactured to contain less than 0.1% of cadmium in acid soluble form. When such pigments are used in polymers further careful analysis reveals extremely low extraction figures of the order of one thousand times less than the toxicological results would indicate as being tolerable.

2 A second study has been conducted in Russia. It involved five pigments one of which was a Cadmium Yellow and in this case toxicological tests were used to indicate the permissible amount of migrating pigment by first conducting feeding tests by using actual pigment.

This was then related to the measured migration of the pigments from polymeric materials in contact with water for periods up to 30 days and temperatures up to 60°C. The work was reported in the International Polymer & Science Technology, Volume 2, number 7, 1975; and the conclusion was that the use of articles of polyethylene or polystyrene coloured with Cadmium Yellow are free from dangers and that these pigments can be recommended for addition to plastics for any purpose.

It is therefore reasonable to assume that the use of Cadmium Pigments presents no health risk to the pigmented polymer users. It is also true that there is no evidence of health risk to the handlers of Cadmium Pigments provided the accepted code of practice used for handling powders are properly observed. In addition both manufacturers and users of Cadmium Pigments have never found them harmful over a number of decades of use. Even allowing for a considerable margin as a safety factor we believe these statements can be made with complete confidence.

Whilst early blood tests in our factories often gave high results which were later shown to be attributable to the poor analytical techniques available at that time, current tests show that even those workers exposed to large volumes of product have cadmium levels which do not differ sensibly from those in unexposed workers, or that which exists amongst the general population.

We feel especially qualified to comment on this as we are not only producers but also consumers of Cadmium Pigments for pigment blends, masterbatches and ceramic colours.

In addition to the use of Cadmium Pigments, attention has been focussed on their possible risk to the environment. Again evidence points to a controllable situation if proper account is taken of the basic chemistry and the natural laws which it obeys. The pigment is in an inert form and if disposed of by burying will add no significant free cadmium to the environment. In addition, it is improbable that dangerous levels will occur from the tipping of ash products from the incineration of pigmented plastic waste.

At the first International Cadmium Conference recently held in San Francisco it was the impression of those attending that:-

(i) Itai-itai disease, often cited in the press, no longer exists.

(ii) Even from the discussions held in San Francisco it was still undecided, due to differing scientific opinions, whether or not cadmium could be considered as the principal toxic agent responsible for itai-itai disease.

(iii) If it is accepted that cadmium was responsible then this was only possible because of the extremely high concentrations involved, coupled with the poor nutritional habits of the people, i.e. low intake of calcium, protein and vitamin D. This situation is not at all comparable with conditions in Europe.

This indicates that reasonable precautions in the handling of Cadmium wastes should eliminate possible occurrences in other regions.

In light of this evidence there is no case for a total ban on Cadmium Pigments and it would therefore seem more reasonable to regard Cadmium Pigments as a separate case to other cadmium compounds.

We continue to emphasise our case and we will issue any reports of future developments should they arise.

BLYTHE COLOURS LIMITED

A Johnson Matthey Company,

CRESSWELL, STOKE-ON-TRENT, ST11 9RD, ENGLAND

Tel: Blythe Bridge (07818) 5959 Telex 36115 Telegrams and Cables Blycol

ART HAZARDS PROJECT

CENTER FOR OCCUPATIONAL HAZARDS, INC.
56 PINE STREET, NEW YORK, N.Y. 10005
212/344-8440

Report to the Inter-Society Color Council
Subcommitte 37 on Artists Materials:

CRITERIA FOR WARNING LABELING ON
ARTISTS' PAINTS CONTAINING CADMIUM

Catherine L. Jenkins, Ph.D.
Information Center Director
Art Hazards Project
National Science Foundation
Public Service Science Resident*

4/17/78

CONTENTS

I. CHEMICAL DEFINITIONS

A variety of cadmium minerals exist in nature, including greenokite (cadmium sulfide), cadmoselite (cadmium selenide), and cadmium oxide (1). Cadmium is used in yellow and red pigments, defined by the Color Index as Pigment Yellow 37 (cadmium sulfine), Pigment Orange 20 (cadmium sulfide and cadmium selenide), and Pigment Red 108 (cadmium sulfide and cadmium selenide) (2). Cadmium sulfide is only slightly soluble in water, but is soluble in acid. Cadmium oxide is even less soluble in water than cadmium sulfide.

In this report, the following chemical abbreviations will be used for simplicity and clarity in reading:

Cd - cadmium metal
CdO - cadmium oxide
CdS - cadmium sulfide (Pigment Yellow 37)
CdS + CdSe - cadmium sulfide and cadmium selenide (Pigment Orange 20 and Pigment Red 108)

II. PHYSIOLOGICAL RESPONSE TO CADMIUM COMPOUNDS

Cadmium compounds are accumulative poisons, with the largest amounts retained in the lungs, liver and kidneys, with lesser amounts retained in the bones and teeth.(3-8) Cadmium concentrations in the blood have been shown to correlate directly with hpertension. It is a causative agent in kidney tubular disorders, such as excretion of

of abnormal amounts of protein, sugar, and amino acids in the urine. Chronic exposures to dusts result in lung deterioration. Reproductive effects have been found in animal studies. Other effects on the body include anemia, liver damage, and testicular destruction.

The cadmium compounds may also be human cancer causing agents; but the case studies on groups of workers exposed to these compounds have been indicative but not conclusive in this respect (4,9-12). Cadmium compounds, including CdS, CdO, Cd, $CdSO_4$, and $CdCl_2$, are proven carcinogenic in animals (13-19).

Persons desiring a more extensive review of the medical literature should obtain the National Institute of Occupational Safety and Health document "Occupational Exposure to Cadmium (4).

II. RELATIVE TOXICITIES OF DIFFERENT CADMIUM COMPOUNDS

The National Institute of Occupational Safety and Health, which is under the Department of Health, Education, and Welfare Public Health Service, states that there is limited information that some compounds of cadmium are less toxic than others, but lack of good data on these differences makes difficult a recommendation of several exposure limits for the different cadmium compounds. It further states that more research must be done before differences in toxicities can be established (4).

Some arguments that CdS is a less toxic form of cadmium are based on the fact that industrial experience with worker exposures to CdS dusts have shown fewer health problems than industrial exposure to CdO and Cd metal. However, in industry, it is much easier to "dose" a man with large amounts of Cd and CdO than it is with CdS, because of the nature of the processes that generate Cd and CdO. In industry, Cd and CdO exposures may come from "fumes" instead of dusts as is the case with CdS. These fumes are much finer and can be inhaled into the lungs and absorbed into the blood stream faster than a CdS dust (20). Also, workers exposed to Cd and CdO are exposed to these substances constantly in their work (battery manufacture) increasing the time and thereby the amount of cadmium taken into the body. CdS workers (pigment and paint manufacture) on the other hand, are exposed to varieties of other substances, sometimes equally toxic (lead, chromates) and sometimes less toxic (titanium dioxide). For the above two reasons, it has been hard to separate out effects on the human body from case studies in industry that are due to exposures to CdS. There are only two studies of industrial worker exposures to only CdS, each showing adverse health effects (21,22), compared to around 100 available studies on workers exposed to other cadmium compounds (4).

The relative insolubility of CdS does not make it less toxic. CdO is even less soluble in water and acid than CdS, but it has caused many toxic effect in workers and animals (4). CdS has caused cancer in laboratory animals (13,14). The National Cancer Institute just completed an extensive study on the carcinogenicity of another highly insoluble substance, Pigment Yellow 12. It produced no cancer in rats and mice, but Pigment Yellow 12, which is much less soluble than CdS, was taken up and deposited under the skin to the extent that the animals turned bright yellow (23). CdS has also been demonstrated to have physiological effects in many other studies (4,24).

IV. HISTORY OF REGULATIONS OF CADMIUM COMPOUNDS

A history of regulations of worker exposures to cadmium compound is very instructive to see the upward trend of the scientific evaluation of the toxicities of cadmium compounds.

In 1941, the American National Standards Institute recommended an average allowable concentration of 0.1 milligrams (mg) cadmium compounds (all compounds, including Cd, CdS, CdO) per cubic meter of air in workplaces, and ammended this standard in 1970 to include a maximum ceiling limit of 0.3 mg per meter air (25). This standard is now the basis for the present federal regulations imposed by the Occupational Safety and Health Administration (26).

In 1974, the American Conference of Governmental Industrial Hygienists recommended a lowering of the permissable concentrations of cadmium compound dusts to 0.05 mg per cubic meter air (27).

In 1976, the National Institute of Occupational Safety and Health recommended a further drop in the worker exposure limits to 0.04 mg per cubic meter of air averaged over a 10 hour work day. The NIOSH's recommended limits apply to all forms of cadmium compounds and include the statement that some cadmium compounds may be more toxi than others, but that lack of good data on these differences make it difficult to recommend different limits for the different compounds of cadmium.

V. COMPARISON OF REGULATION OF CADMIUM COMPOUNDS AND OTHER SUBSTANC

The American Conference of Governmental Industrial Hygienists recommended the following limits (Threshold Limit Values) for the concentrations of toxic compounds (27):

Dusts of all cadmium compounds (e.g. cadmium pigments)	0.05	mg per cu. meter air
Dusts of all mercury compounds (e.g. vermillion pigment)	0.05	"
Dusts of inorganic lead compounds (e.g. flake white pigment)	0.15	"
All chromium (VI) compounds (e.g. zinc chromate or lemon yellow pigments)	0.05	"
Titanium dioxide (titanium white pigment)	10.00	"
Calcium carbonate (chalk dust)	10.00	"

From the above, the toxicitiy of cadmium is rated as similar to that of all of the lead and mercury compounds. Nuisance dusts, like chalk and titanium white, have a much higher allowable concentration becaus of their much lower toxicity.

VI. NEED FOR WARNINGS ON ARTISTS' PAINTS

A. Persons Using Art Materials are Unadvised of Toxicities

Art and craft materials are used by a wide segment of the population, not just professional artists. The National Research Center for Arts, Inc., found that 39% of the general population of the U.S. (57 million people) over 16 years of age were currently engaged in some craft, either professionally or as hobbyists, with 16% engaged

in either painting, drawing, or sculpture (28). The professional artist is usually not taught in courses how to work with certain toxic substances safely, and the much larger segment of the population using art materials receives no formal instruction and is therefore completel unadvised of the potential hazards of materials unless the warnings appear on the material itself.

B. Children Using Adult Art Materials

Children in classes often use adult art materials, particularly the acrylic paints. Children are more suseptible to toxic materials because of their rapid metabolism and inability to carry out safety precautions, such as careful personal cleanliness.

A recent study (24) illustrates this point. Children in a private school in Japan using their fingers in water painting did have demonstrable body uptake of cadmium and lead paint. The average urinary cadmium level of 25 students, ages 4 to 11, was 0.68 micrograms per liter; that of control students not practicing art was 0 micrograms per liter. We would not suspect that these children were intentionally eating the paint, particularly in the older age group. Also, before lunch, the children would have washed most paint from their hands. However, the amounts of cadmium sulfide paint exposures were high enough to cause contamination and accidental ingestion leading to measurable amounts of cadmium in the children's bodies.

C. Art Materials Used for Toys and Other Purposes

The usage of fine art paints is not restricted to paintings. At the Art Hazards Project, we receive many inquiries from persons using particularly the acrylics for the faces of dolls, toys, wooden platters, retouching dinnerware, etc. If no warning label appears, these products are and will be used indiscriminantly, and will be left lying around in the reach of children where they may be misused.

VII. LABELING FOR ARTISTS' PAINTS CONTAINING CADMIUM

A. Labeling Requirements for Cadmium Containing Substances Recommended by NIOSH

The National Institute of Occupational Safety and Health recommends the following precautions placed on all containers of substances containing cadmium compounds:

> DANGER
> Contains Cadmium Sulfide. Poisonous fumes may be formed on heating. Harmful if inhaled or swallowed. Avoid contact with skin, eyes, and clothing. Wash hands thouroughly after handling. Avoid breathing dust. Keep container closed. Use only with adequate ventilation.

B. Recommendations by the Consumer Product Safety Commission

A toxic substance is defined by the Consumer Product Safety Commission as any substance which has the capacity to produce personal injury or illness to man through ingestion, inhalation, or absorption through any body surface (29). The Federal Hazardous Substances Act specifies labeling requirements for consumer products as to signal words, statement of hazards, instructions to read carefully cautionary

information, and placement and size of labeling so as to be distinctive (30). A hazardous toxic substance must bear labeling which states conspicuously 1) the common, usual or chemical name of the substance, 2) the signal work "CAUTION" or "WARNING", 3) a statement of the hazard, 4) precautionary measures, 5) instructions when appropriate for first aid, 6) instructions for safe handling, and 7) the statement "keep out of reach of children" (31).

Provision for collapsible metal tubes is made by stating that items of hazardous label information shall be placed near the dispensing end of the container (32).

The Consumer Product Safety Commission will offer informal comment on any proposed label and accompanying literature involving a hazardous substance (33).

C. Recommended Labeling

For tubes of artists paints containing cadmium, the following labeling should apply:

WARNING!
CONTAINS CADMIUM SULFIDE. HARMFUL IF SWALLOWED OR INHALED. AVOID CONTACT WITH SKIN, EYES, AND CLOTHING. WASH HANDS THOUROUGHLY AFTER HANDLING. KEEP OUT OF REACH OF CHILDREN. DO NOT USE ON TOYS OR OTHER SURFACES USED BY CHILDREN.

In addition to the above instructions, dry pigment powders or aerosol products containing cadmium colors should bear the additional labeling

USE ONLY WITH ADEQUATE VENTILATION. AVOID BREATHING DUST. KEEP CONTAINER CLOSED.

VIII. CALL FOR INFORMATION A RECOMMENDATIONS FOR LABELING OTHER ARTISTS' PAINTS AND PIGMENTS

The Art Hazards Project of the Center for Occupational Hazards, Inc., in conjunction with the Inter-Society Color Council Task Force on Toxicity and Truth in Labeling of the Subcommittee on Artists' Materials, invites comments, recommendations for labeling, and toxicological data on other pigments. Ideas on the inclusion of detailed safety instruction package inserts is also solicited.

Data or recommendations on the organic pigments and lakes, as used in industry or other applications, is particularly solicited at this time (before May 1, 1978), because of my involvement in preparing material for a section of a criterion document by the National Institute of Occupational Safety and Health on "Manufacture of Paints and Allied Products."

* This report was prepared with the support of National Science Foundation Grant No. OSS77-23951, and public funds from the National Endowment for the Arts and the New York State Council on the Arts. Its views are those of the author and do not necessarily reflect those of NSF, NEA or NYSCA.

REFERENCES

1. Cox, D. B. "Cadmium-A Trace Element of Concern in Mining and Manufacturing." J. Envir. Health, 36, 361 (1974).

2. American Association of Textile Chemists and Colorists, Color Index, 3rd Ed. AATCC, Research Triangle Park, NC (1971).

3. Friberg, L., M. Piscator, G. F. Nordber and T. Kjellstrom Cadmium in the Environment, 2nd Ed. CRC Press, Inc., Cleveland (1974).

4. National Institute for Occupational Safety and Health Criteria for a Recommended Standard...Occupational Exposure to Cadmium. Dept. of Health, Education and Welfare Publication No. (NIOSH)76-19 (Review of medical literature with 287 references) Single copies available by writing the Public Health Service, Center for Disease Control, NIOSH, Cincinnati, OH 45226.

5. See also: NIOSH Criteria for a Recommended Standard...Occupational Exposure to Chromium (VI) Compounds. (Review with 185 references on the toxicity of the chromate pigments) Obtainable from above.

7. Patty, F. A., ed. Industrial Hygiene and Toxicology, Vol. II. Interscience (1963).

8. Sax, N. I. Dangerous Properties of Industrial Materials, 4th Ed. Litton, (1975).

9. Potts, C. L. "Cadmium Proteinuria-The Health of Battery Workers Exposed to Cadmium Oxide Dust." Ann. Occup. Hygiene, 8, 55 (1965).

10. Adams, R. G., J. F. Harrison, P. Scott "The Development of Cadmium Induced Proteinuria, Impaired Renal Function, and Osteomalacia in Alkalin Battery Works." Q. J. Med., 38, 425 (1969).

11. Kipling, M. D., J. A. H. Waterhouse "Cadmium and Prostatic Carcinoma." Lancet 1, 730 (1967).

12. Lemen, R. A., J. S. Lee, J. K. Wagoner, H. P. Blejer "Cancer Mortality Among Cadmium Production Workers." Ann. N. Y. Acad. Sci. 271, 273 (1976).

13. Kazantis, G. "Induction of Sarcoma in the Rat by Cadmium Sulfide Pigment." Nature, 198, 1312 (1963).

14. Kazantis, G. and W. J. Hanbury "The Induction of Sarcoma in the Rat by Cadmium Sulfide and By Cadmium Oxide." Brit. J. Cancer 20, 190 (1966).

15. Haddow, A., F. J. C. Roe, C. E. Dukes, B. C. V. Mitchley "Cadmium Neoplasi: Sarcomata at the Site of Injection of Cadmium Sulfate in Rats and Mice." Brit J. Cancer 18, 667 (1964).

16. Roe, F. J. C., C. E. Dukes, K. M. Cameron, R. C. B. Pugh and B. C. V. Mitchley "Cadmium Neoplasia: Testicular Atrophy and Leydig Cell Hyperplasia and Neoplasia in Rats and Mice Following the Subcutaneous Injection of Cadmium Salts." Brit. J. Cancer 18, 674 (1964).

17. Gunn, S. A., T. C. Gould, and W. A. D. Anderson "A Comparative Study of Instersitial Cell Tumors of Rat Testis Induced by Cadmium Injection and Vascular Ligation." J. Nat'l. Cancer Inst. 35,329(19

18. Gunn, S. A., T. C. Gould and W. A. D. Anderson "Specific Response of Mesenchymal Tissue of Carcerogenesis by Cadmium." Arch. Pathol. 83, 493 (1969).

19. Heath, J. C. and M.R. Daniel "The Production of Malignant Tumors by Cadmium in the Rat." Br. J. Cancer, 18, 124 (1964).

20. National Institute of Occupational Safety and Health The Industri Environment-Its Evaluation and Control. U.S. Dept. of HEW, Center for Disease Control, U.S. Supt. of Documents (1973).

21. Kazantzis, G., F. V. Flynn, J. S. Spowage, D. G. Trott "Renal Tubular Malfunction and Pulmonary Emphysema in Cadmium Pigment Workers." Q. J. Medicine, 32, 165 (1963).

22. Princi, F. "A Study of Industrial Exposures to Cadmium." J. Industrial Hygeine and Toxicology 29, 315 (1947).

23. National Cancer Institute "Bioassay of Diarylanilide Yellow for Possible Carcinogenicity." Dept. of HEW Publication No. (NIH)78-8 Single copies available from Division of Cancer Cause and Preventi NCI, Bethesda, MD 20014 (1978).

24. Mori, T. and A. Sinji "The Analysis of Metals Contained in Water Colors and Urinary Lead and Cadmium in Children who Practice Finge Painting in a Private School." Japanese J. Hygiene 3, 399(1976).

25. American National Standards Inst., Inc. "Acceptable Concentrations of Cadmium Fume and Cadmium Dusts, Z37.5. New York, ANSI (1970).

26. Dept. of Labor, Occupational Safety and Health Standards 29 CFR 1910.1000, Federal Register, 39, 23543 (1974).

27. American Conference of Governmental Industrial Hygienist Threshold Limit Values for Chemical Substances in Workroom Air,ACGIH (1974-7

28. National Research Center for Arts, Inc. "Survey of Public Opinion in the Arts." Americans and the Arts, (1975).

29. Code of Federal Regulation, Title 16, Commercial Practices, Chapte II-Consumer Product Safety Commission, Subchapter C-Federal Hazard Substances Act Regulations, Part 1500.128.

30. Ibid., 1500.121

31. Ibid., 1500.14

32. Ibid., 1500.121

33. Ibid., 1500.128

HEALTH REASSESSMENT FOR CADMIUM PIGMENTS

by

David J. Heiser
Scientist
Glidden Pigments Group
SCM Corporation
3901 Glidden Road
Baltimore, Maryland 21226

Introduction:

Federal regulatory agencies have given some well publicized attention to cadmium in the workplace and in the environment during the past few years. As a result considerable confusion and uncertainty about the safety of cadmium pigments has been created within the pigments-using industries and among the general public. It's time, therefore, that what's being heard about adverse health effects of cadmium be placed in a broadly balanced perspective, particularly in relation to cadmium pigments. Our object here, then, is to present some facts and perspectives about cadmium toxicology which might otherwise easily be overlooked.

In considering cadmium materials, it is essential to distinguish among three categories of industrial operations using cadmium. In the first are metallurgical cadmium operations in which fumes of both cadmium metal and cadmium oxides are produced. These fumes are toxic and dangerous through either inhalation or ingestion by swallowing. The second category includes cadmium electroplating and battery fabrication which use soluble cadmium salts. These materials are

70-237 O - 81 - 18

toxic by oral ingestion inasmuch as they are easily absorbed by the body and accumulate to damage certain organs, particularly the kidney. The third category comprises cadmium pigments. These materials are quite insoluble, and are two to three orders of magnitude less hazardous to human health than other forms of cadmium because their very insolubility forestalls absorption of the cadmium into living tissue.

Low Solubility of Pigments

The cadmium in yellow cadmium pigments consists of cadmium sulfide; the orange and red shades also contain selenium in the sulfide crystal. The solubility data in Table I show that pure cadmium sulfide is practically insoluble in both water and dilute acid. In fact, while the water solubility of cadmium oxide is also low, the solubility of cadmium sulfide is at least five orders of magnitude even lower. However, the critical distinction between the two compounds is the dilute acid solubility, as in the stomach for example: CdO is completely soluble; CdS is insoluble.

TABLE I

Solubilities of Cadmium Compounds

	Cadmium Sulfide CdS	Cadmium Oxide CdO or $Cd(OH)_2$	Cadmium Salt $CdCl_2$
Solubility in Water, moles per liter [reference (1)]	$1.46(10)^{-10}$	$1.1(10)^{-5}$ to $3.8(10)^{-5}$	5.30
Solubility Product in Water;	$[Cd^{++}][S^{=}]$	$[Cd^{++}][OH^{-}]^2$	
Reference (1):	$1.14(10)^{-28}$		
(2):	$3.6\ (10)^{-29}$		
(4):		$1.7(10)^{-14}$ to $6.5(10)^{-14}$	
Solubility Product in 0.4 molar acid [reference (3)]	$3.7\ (10)^{-29}$	Completely Soluble	Soluble

For commercial cadmium pigments, the fraction of the material extractable into water or acid under specific test conditions has been determined in a study by Hazleton Laboratories (5). For a series of different pigments, the amount of cadmium dissolvable in distilled water ranged from $2.6(10)^{-4}$% to $1.1(10)^{-1}$% of the total pigment. In 0.1 N HCl the percent extracted ranged from $1.7(10)^{-2}$% to $5.8(10)^{-1}$% in equilibrium tests with periodically replaced solvent, and from 0.17% to 1.28% in dynamic tests with continuously fed fresh solvent.* Under either test mode, CdO would continuously dissolve in 0.1 N HCl.

---

* The various pigment samples used were chosen to give a deliberately wide range of solubility. Materials in the high solubility ranges are not normally found in commercial

Bio-Absorption

The bearing that solubility has on the extent of absorption of cadmium into the body was the principal problem addressed by the Hazleton Laboratories study. Pigments were fed to rats at concentrations of 1% to 5% in their feed for seven days. Then analyses were made to find the amount of cadmium actually absorbed in body tissue as distinct from that which passes on out through the gastrointestinal tract. The study was designed to reveal any relationship between solubility and bioabsorption in the test group of cadmium pigments having a wide range of solubilities. Of the total pigment fed, the percent cadmium absorbed in the rat body ranged from 0.0008% for the least soluble pigment tested (Cd solubility = 0.126%) to 0.0060% for a very high solubility material (Cd solubility = 1.28%). Thus the pigments contributed less than 1% of their soluble cadmium to the biological system of the animal. None of the test animals were observed to suffer from any clinical signs of toxicity.

By comparison, absorption of cadmium from soluble cadmium salts was found in this same study to be from one hundred to one thousand times greater than from the various pigments. Since toxic effects of cadmium depend on its first being absorbed within the body, the point here is that cadmium solubility is an important factor in considering relative toxicity of cadmium materials.

Toxicity of Various Cadmium Materials

What then is the actual toxicity of cadmium pigment? The acute oral lethal dose (LD_{50}) of cadmium pigments fed to rats has been established (6) at values greater than 10,000 milligrams pigment per kilogram of body weight.* This represents a non-toxic response at about the highest practical amount that can be fed to a rat. In contrast, the LD_{50} for soluble cadmium chloride salt is 88 mg/kg. (7). With respect to chronic ingestion, the Russians (8) reported that a daily dose of 6 mg/kg. of cadmium pigment fed to mice and rats over a period of nine months was toxicologically non-active. This compares with 0.0007 mg/kg. as the daily human intake of cadmium from food in the U.S., estimated by the FDA (9).

In toxicity studies on fish conducted by Industrial Bio-Test Labs (10), pigment samples from various manufacturers were added to the water supporting the fish which were then observed over four days for behavior and survival. The medium tolerance limits (TL_m) of all three species of fish tested, rainbow trout, bluegills, and channel catfish for most of the pigments were found to be greater than 100 ppm which is graded "practically non-toxic" in the classification system used by NIOSH (11). This means that insoluble cadmium pigments have the same level of toxicity as inert particulate

* In reading toxicity data, the larger the number, the more test-material an animal can tolerate, and the lower the toxicity.

substances such as kaolin clay or finely-divided limestone (diatomaceous) earths. The main effect with either pigment or clay is that the solid particles become trapped in the fish gills, leading to respiratory irregularities. On the other hand, soluble cadmium chloride was reported to have TL_m = 0.12 ppm, showing soluble cadmium salts to be nearly a thousand times more toxic than insoluble cadmium pigment.

The Cancer Issue

The current preoccupation with the cancer issue by our federal and state lawmakers and regulatory agencies has served well to confuse, mislead and upset the public, and to raise awesome questions of operating costs for chemical industry. Cadmium too has been cited for causing cancer by the alarmists who take exaggerated views of early, preliminary studies which at best constitute only tiny fragments of a complete cancer assessment. Even today the assessment is far from complete, and "the available data are too meager to draw any conclusions about cancer from cadmium in man." (12)

In the 1960's it was demonstrated (13) that intramuscular or subcutaneous injection of cadmium metal powder or cadmium sulfide, oxide, sulfate, or chloride in rats or mice can cause cancerous sarcomas. But such effects are limited to the site of injection and do not spread to other parts of the body; that is, they are not systemic. Thus, "there is a growing belief that the induction of subcutaneous sarcoma is not indicative of chemical carcinogenesis. (14)

Furthermore, for cadmium materials administered orally, there is no evidence of carcinogenicity of cadmium in man or animals following ingestion. For example, at the Institute of Cancer Research in England (15), water soluble cadmium sulfate was administered orally to rats over two years, and no carcinogenic effects were observed. This important distinction between tumors at the subcutaneous injection site and lack of carcinogenic effect following oral administration of cadmium has been recognized by the EPA (16).

In human beings, interest in carcinogenic effects has mainly been focused on cancer of the prostate in workers industrially exposed to cadmium oxide dust and fume (17, 18, 19, 20). Apart from deficiencies in these studies discussed by Friberg (17), consideration of prostatic cancer really should not be a part of overall cancer assessment because prostatic cancer being a universal prospect is a calculable risk to anyone who lives long enough irrespective of exposure (21). The following comparison illustrates the point: Populations in Sweden and Norway where cadmium exposure is low, have some of the highest prostatic cancer rates in the world. On the other hand, in Japan where cadmium exposure is high (and even "low exposure regions" have four times the mean world-wide cadmium level) the rate of prostatic cancer is one-tenth the world rate (21). Thus only an inverse correlation exists, if any.

Very recently a case study was reported of cancer among workers in Sweden occupationally exposed to cadmium oxide dust in a cadmium-nickel battery factory and to cadmium oxide fume in a copper-cadmium alloy smelter (22). The data showed that the number of deaths due to cancer and the incidence of new cancer cases over the period of study 1945-1975 were less than those expected in the general population as determined by life-table calculations. For example, in the whole group of workers with exposure durations between 5 and 50 years, there were 43 deaths while 67 were generally expected in the population from non-cadmium related causes. Again, between 1959 and 1975 there were 15 new cases of cancer where 16 were expected. The study concludes that "there was no increase in general cancer mortality or in general cancer incidence," and the author stated "You cannot say that cadmium causes cancer."

Mechanism of Cadmium Poisoning

What then is all the fuss about cadmium toxicity? At this juncture perhaps a side trip to the bio-mechanics of cadmium poisoning would be in order. The following description is a summary of ideas presented at the 1978 International Conference on Cadmium held at the National Institutes of Health, Bethesda, Maryland on June 7-9, 1978.

In animals given experimental oral doses of soluble cadmium salts, cadmium is absorbed into the body through the intestines. In man exposed to cadmium metallurgical fumes, cadmium is absorbed into the body through the lungs. On absorption via either ingestion or inhalation, blood is the vehicle for transporting cadmium through the body. Cadmium in blood is taken up by the liver where it induces the synthesis of a special protein, called metallothionein, which binds cadmium, zinc, and certain other metal ions. The protein-bound cadmium is then released back into the bloodstream from which it is absorbed by and deposited in the kidneys. Accumulation of cadmium-metallothionein in the kidney progressively disturbs the functioning of the kidney filter cells (the proximal tubules of the kidney renal cortex) allowing the passage of low molecular weight proteins into the urine. This condition, called tubular proteinuria, is one of the earliest signs of chronic cadmium intoxication. Progressively more severe damage to the kidney results from continued exposure to and absorption of cadmium, inducing increased urinary excretion of amino acids (Aminoaciduria), glucose (Glucosuria), calcium (hypercalciuria), and phosphates (Phosphaturia) as later signs of more advanced kidney damage.

The onset of kidney disfunction does not occur until accumulation of cadmium in the kidney reaches some "critical concentration." Kidney cadmium levels at which definite signs of kidney damage are observed in animals fall in the range of 150 to 300 micrograms cadmium per gram of organ wet weight.

Once kidney renal tubular disfunction has proceeded to the point of pronounced proteinuria, it is essentially irreversible. It should be noted, however, that kidney disfunction is not kidney failure. The animal or person is still able to rid the body of nitrogeneous wastes through urinary production and excretion.

In the case of pigments which have very low bioabsorbability, there is very little liklihood of acute cadmium poisoning from a single massive dose. There can be cause for concern, however, that even at low levels of absorption, over a long period of time, continuous ingestion of pigment could contribute to critical organ cadmium concentrations leading to adverse chronic effects. But with reasonable personal hygiene and respiratory protection, even this slim possibility can be avoided.

Occupational Exposure to Cadmium Pigments

The really pertinent consideration for assessing cadmium pigment hazard to humans is the experience of persons continually in contact with these materials. The central fact is that workers have handled cadmium pigments in pigment manufacturing plants for many years without ill effects.

A frequently quoted study in this regard is that by Kazantzis (23) who studied six workers exposed to cadmium sulfide dust for terms from 28 to 45 years and to cadmium oxide fume and dust for shorter periods. All six men had developed both tubular proteinuria and hypercalciuria. One man died of bronchial carcinoma, and two others developed kidney stones as a result of the hypercalciuria. In the others, the renal tubular disfunction remained symptom free without further adverse clinical effects.

But at the National Institutes of Health Conference on Cadmium, Kazantzis (24) reported further observations to clarify the situation. In workers exposed to cadmium sulfide dust over a number of years, but with much less exposure to cadmium oxide fume and dust than Kazantzis' first group, the various kidney functions remained normal. For example, release of proteins, calcium, glucose, and amino acids into the urine were within normal limits, and the composition of uria protein was normal. This indicates that the real culprit in cadmium poisoning is cadmium oxide fume, not cadmium sulfide pigment dust.

Two other examples are within the writer's experience. At Johnson, Matthey and Co., London (25, 26) workers in a pigment manufacturing facility have been monitored for 13 years by means of urine analysis, lung function tests, and chest X-rays. In the workers handling only cadmium sulfide and cadmium sulfoselenide pigments, there has been no evidence of proteinuria or of abnormalities in the respiratory functions despite high exposures over a period of from 7 to 27 years.

Finally, at the Glidden cadmium pigment plant in Baltimore (27) there has been no evidence of proteinuria in workers exposed to various stages of pigment production for up to 28 years.

Cadmium pigment dusts are non-corrosive, non-irritating, and non-sensitizing to the skin, although they may be irritating to the eye, as is any nuisance dust. Inhalation of pigment dust may cause irritation of mucosal membrances.

Conclusion

The toxicity issue causing uncertainty today will eventually settle down to reasonable responses in areas of genuine hazard. But because cadmium pigments are the least hazardous of cadmium materials, and in themselves present a low risk of injury to health, they will continue to be manufactured and made available in commerce with minimal regulation.

Cadmium pigments have numerous benefits in the way of color brilliance, opacity, tinting strength, and heat and light stability. They are available in a wide range of shades in the very bright or high chroma region, less sensitive than organics to variations in dispersion technique, and without tint range-dependent chromaticity maxima. These well known desirable attributes more than offset their minimal risk as a health hazard.

ICWU
INTERNATIONAL CHEMICAL
WORKERS UNION
PHONE (216) 867-2444

FRANK D. MARTINO, PRESIDENT
J. A. THOMAS, SECY-TREAS.

17 April 1979

Mr. David J. Heiser
Industrial Scientist
SCM Chemical/Metallurgical
Glidden Pigments Group
3901 Glidden Road
Baltimore, Maryland 21226

Dear Mr. Heiser:

I am sorry not to have been able to reply to your letter earlier in regards to my paper presented from the Art Hazards Project to the Inter-Society Color Council on April 17, 1978, but my new job has been time consuming. There is really no new evidence on cadmium sulfide (CdS) pigment toxicity to be presented here; it is not needed to establish a need for precautionary labels on CdS as used in artistic media. Both industrial manufacturers and some artists' paint manufacturers currently use warnings and hazard labels for their products containing CdS.

We should be happy if CdS pigments in particular were proven non-toxic and non-carcinogenic at some time in the future. They are important quality yellow pigments with other suitable yellow pigment alternatives each having its own peculiar toxicity problems.

SOLUBILITY vs PHAGOCYTIC MECHANISMS

You have used the low solubility of CdS to support no physiological effects from CdS. In my September 20, 1978, letter to you I pointed out that phagocytic and colloidal mechanisms might also be operative, and gave an example of this process which leads to an intercellular colloid. In your October 3, letter you stated that you were anxious to learn from me by what particular colloidal or enzymatic mechanisms cadmium can specifically be absorbed.

A quote from the National Institute for Occupational Safety and Health Publication No. 77-81, Occupational Diseases, page 15: explains these phagocytic mechanisms and other intercellular penetration of dust leading to liquid/solid colloids:

"Phagocytosis represents the major mechanism for clearing

> most particles from the lung. Moreover, the presence of dusts stimulates the appearance of phagocytes at the site, so that repetitive exposures increase the rate of phagocytosis and hence the rate of clearance of dust from the lungs. Lymph drainage of the dust-filled phagocytes to the lymph nodes represents 2 to 10% of the clearance of the total pulmonary dust burden for certain insoluble oxide dusts."
>
> "Direct intercellular penetration offers another clearance mechanism..."

These phagocytic and intercellular penetration mechanisms leave open the possibility that inhaled cadmimum sulfide dusts would be absorbed through the lungs and carried to the lymph nodes. The dust would therefore remain in the body for the rest of a person's life, constantly being dissolved bit by bit. The solubility of cadmium sulfide may be low, but a constant "washing" over years inside the body could effectively solubilize the retained cadmium sulfide.

As far as specific enzymatic mechanisms increasing cadmium absorption, we cannot be certain. However, one may well be operative in the case where polychlorinated biphenyl (PCB) exposures increased the accumulation of cadmium in the kidneys of animals (Journal of the Human Environment, Royal Swedish Academy of Sciences, first issue of this year). Here enzymatic or metabolic suppression by PCB's in the controlled experiment may be occurring, causing the increased cadmium absorption.

And again, 1.3% solubility of CdS is the stomach contents presents a probable chronic if not acute hazard in many exposure situations, even without these alternative biological entry routes.

EPA HAZARD ASSESSMENT OF CADMIUM

In your October 3, letter you attributed the following conclusion to the Environmental Protection Agency (EPA) Subcommittee on Cadmium as a Possible Hazardous Air Pollutant; which met in March of this year:

> "Prostatic cancer is a calculable risk to anyone who lives long enough irrespective of atmospheric exposure, and consideration of prostatic cancer, being a universal prospect really should not be a part of overall cancer assessment. Furthermore, in subsequent discussion Dr. Magnus Piscator, consultant to the Subcommittee, and a principal speaker at the International Conference on Cadmimum at the National Institute of Health last June, made the following comparison: Populations in Sweden and Norway where cadmium exposure is low, have some of the highest prostatic cancer rates in the world. On the other hand, in Japan where Cd exposure is high (an even "low exposure regions" have four times the mean world-wide cadmium level) the rate of prostatic cancer is one-tenth the world rate. Thus a correlation, if any exists, would be negative."

I, for one along with approximately half the population, will never get

prostatic cancer, so it is not "a universal prospect." You also implied that Dr. Piscator, in finding negative correlations between general overall population prostatic cancer rates and general environmental cadmium concentrations, thought therein lay evidence for a negative correlation between prostatic cancer and cadmium. Prostatic cancer is both rare enough and capable of being caused by other carcinogens besides cadmium, so that general population studies will give blurred results and results that could be indicative of factors other than cadmium. General country-wide epidemiological studies are never relevant in pinpointing causes of occupational or specific agent carcinogensis, and I doubt Dr. Piscator was attempting to draw this conclusion.

In fact, EPA recently commissioned a large scale multi-national study of the relationship of cancer and occupationally exposed cadmium workers. Dr. Robert Horton, EPA's Project Officer for this study, noted that the two cadmium factory studies already completed, one in the U.S. and one in England, did show an excess of prostatic cancer in both groups and excessive lung cancer in one group.

You attribute the following to the EPA Subcommittee in your letter:

> "The document relies on positive tests for mutagenicity as indicating carcinogenicity. The chairman insisted, however, that mutagenicity does not correlate with carcinogenicity, and the one property does not imply the existence of the other."

The document did rely on much other evidence for carcinogenicity of cadmium, such as positive animal and human studies. The chairman would be in error if he/she said there was no correlation between mutagenicity and carcinogenicity. The director of the National Cancer Institute, along with many, many scientists recognize a positive correlation. Even industry recognizes the correlation; American Cyanamid last summer instituted controls to protect workers from exposures to two Vat Dyes based on mutagenicity tests done by Dyes Environment and Toxicology Organization (DETO), an industry trades association!

Cd DATA PRESENTED AT NAMTA CONFERENCE

You distributed at a National Art Material Trade Association conference in March of this year an article entitled "The Case for the Continued Acceptance of Cadmium Pigments" from Blythe Colours Limited, a Johnson Matthey Company in England, which contains the following statement:

> "Firstly, it can be said that there is no evidence - direct or indirect - of any harm arising from the manufacture or use of Cadmium Pigments."

Excessive cadmium levels in the blood and urine of workers melting down pure cadmium metal to make the pigments might not be considered "harm". The higher than average incident of prostatic cancer in other cadmium workers might not be considered by this company "indirect evidence" or even "harm". Much other evidence, as presented in my original ISCC report, by the International Agency for Research on Cancer, and the National Institute for Occupational Safety and Health show much more

evidence accepted even by yourself as indirect - you have said you had no objection to warning labels!

INTERNATIONAL CONFERENCE ON CADMIUM

In your October 3, letter you made the statement:

> "I infer from your letter...that you apparently hold in high regard the work reported at the..."

If I regard highly the work of an imminent researcher such as Dr. Rall, there is no logical basis to make the inference that I would also esteem the work of every other researcher who might participate with him in a conference (case in question), work for the same organization (National Institute of Health), or perhaps serve on the same faculty of a university.

JAPANESE STUDY

A Japanese study, mentioned along with 33 other studies in my April, 1978, ISCC report, measured cadmium and lead levels in the urine of children attending a private painting school. It has attracted a lot of attention, particularly because only an English abstract was available to DMCA members and myself until John Dickerson of Harshaw Chemical had the first translation made during December, 1978. A copy of the English abstract is attached here.

You did not address this study in either of your letters because at the time you did not have the translation. But I feel free to discuss it here since it does seem to be a topic of current interest.

Cd Content in Paints used by Children

The information in my April, 1978, report was taken from an English abstract by the original authors published in Exerpta Medica. The authors stated that there was a high correlation (0.91) between the amount of Cd in the children's urine and the amount of time they "practiced painting" at the school. There was less of a correlation (0.71) between the amount of Cd in the urine and the age of the children. Information for lead was also given: a high correlation for Pb in urine (0.98) and number of years experience was found but a much lower correlation (0.10) was found between urinary lead and the age of the children.

The author's English abstract did not give an analysis of the paint used by the children but opened with the statement:

> "It is well known that water colours and poster colours are made of inorganic pigments that then contain metals such as Cr, Pb, Fe, Co, Cd, Hg, etc."

From the complete English translation, however, it was made clear that the paints used by the children did not contain cadmium, so my attributing the higher urinary Cd content to their usage of cadmium sulfide paints was unwarranted.

Significance of Cd Levels in Urine

The Japanese study shows some interesting results. The authors found a

high relationship between the urinary levels of both cadmium and lead levels with the amount of experience at the school, but not such a high relationship simply comparing the ages of the children and their cadmium and lead levels.

The researchers make 5 statements in their 3 pages of text emphasizing the correlation of urinary Cd with experience, with the last statement being the final statement of their article. This does not include the additional statement in the abstract.

> "The correlation between the Cd content in urine and the number of years of experience (0 to 7 years) is 0.913...."
>
> "In the case of Cd, the correlation coefficient for the 30 children with the number of years experience up to 7 is 0.91...."
>
> "It is observed that the degree of correlation between the number of years of experience and the Pb and Cd contents in urine is high, and there is a linear increase. The correlation between age and the Pb content in urine is 0.10, and that between age and the Cd content in urine is 0.72."
>
> "...attention should be paid to the fact that both Pb and Cd contents in urine increase with the number of years of experience."
>
> "There was observed a tendency that the Cd content in urine increased with age. In addition, the correlation coefficient between Cd content in urine and the number of years of experience was 0.91...."

The researchers are therefore concluding and stress that the longer the child attended this particular school, the higher its urinary Pb or Cd. However, just because a child was older did not correlate as well with higher levels of Pb and Cd, particularly not in the case of Pb. A problem with Cd and Pb associated with this school has been indicated.

The significance of the Cd levels in the urine of the children in painting school cannot be rejected by comparison to the results of other researchers using other experimental techniques on other children in other situations. Different analytical techniques may be more or less sensitive. If comparisons to existing data were valid, then we would have no need for the control groups as were rightly used in this study.

It is unfortunate, however, that only 5 control subjects were found, thus decreasing the statistical validity of the experiment. A larger control group at least the size of the experimental group of 25 could well have demonstrated a statistically significant greater amount of Cd instead of the simple greater amount of Cd in the urine of the children at the painting school.

I have written the authors directly for more information, such as a possibility of adult artists using cadmium sulfide pigments in the same studio, or a heightened synergistic uptake of environmental cadmium

possibly due to the use of polychlorinated biphenyl (PCB) contamined phthalocyanine pigments, as was mentioned earlier in this letter. The study is particularly interesting for all of us concerned with usage of toxic materials such as lead by children.

CONCLUSION

We do not question the acute toxicity, or rapidly occurring detrimental health effects of cadmium sulfide. Preliminary subacute animal studies presented by yourself at the NAMTA conference and other studies establish this. Your preliminary short term absorption studies on animals, however, should not be used to make quantitative extrapolations to human absorption rates.

Long term chronic health effects, such as cancer, are still a very great possibility. The wide range of solubilities of cadmium sulfide does cause concern. Other major industrial manufacturers use warning labels on their cadmium sulfide pigments, and even you yourself have stated that you had no objection to warning labels.

Sincerely,

Cate Jenkins
Occupational Health Specialist

CLJ/p
Enclosure
cc: Frank D. Martino
Stanley W. Eller
Joy Turner Luke
Congressman Fred Richmond
Dr. Mike McCann
Monona Rossol
Dr. John Dickerson
Henry Levison
Jasper Adams
Dr. Fred Billmeyer
Dr. Treva Pamer
Dr. Leonard Goldwater
Howard Lamstrom

ponents in the supernatant fraction of liver, kidney and intestinal mucosa homogenates of cadmium-administered rats, Japanease J. Hygiene, 28, 492-496 (1973).

13) Piotrowski, J. K., et al.: Mercury binding in the kidney and liver of rats repeatedly exposed to mercuric chloride: Induction of metallothionein by mercury and cadmium, Toxicol. Appl. Pharmacol., 27, 11-19 (1974).

14) Surtshin, A. & Yagi, K.: Distribution in renal cell fractions of sulfhydryl groups in rats on normal and sucrose diets and its relation to renal mercury distribution after mercuric chloride injection, Am. J. Physiol., 192, 405-409 (1938).

15) 只友厚雄: $^{203}Hg(NO_3)_2$ を用いた水銀中毒に関する実験的研究, 岡山医学会雑誌, 74, 701-711 (1962).

(受付 1975年12月18日)

水彩絵具の含有金属の分析と絵画教室に通う子供の尿中 Pb, Cd

The Analysis of Metals Contained in Water Colours and Urinary Pb and Cd of Children who Practice Painting in a Private School

岡山大学教員養成講座
森　忠繁
東邦大学医学部衛生学教室
大本美彌子・石見敦子・大羽和子
京都府立医科大学衛生学教室
明石信爾

Tadaschige Mori
Training Institute for Health-Teachers, Okayama University, Okayama.
Miyako Ohmoto, Atuko Ishimi, Kazuko Ohba
Department of Hygiene, School of Medicine, Toho University. Tokyo.
Shinji Akashi
Department of Hygiene, Kyoto Prefectural Medical University, Kyoto.

It is well known that water colours and poster colours are made of inorganic pigments that then contain metals such as Cr, Pb, Fe, Co, Cd, Hg etc.. Recently, promoting the culture of sentiments, children practice painting with their fingers using water colours and poster colours, that is called the finger-painting. It is possible that inorganic metals contained in water colours and poster colours are potentially hazardous to children who practice painting in a private school. Each of four colours of red, blue, yellow and green of water colours and poster colours was analyzed for Cr, Pb, Fe, Co, Cd and Hg. And urinary Pb and Cd were determined on twenty five children, ages 4 to 11 of a private school of the painting and five control children ages 3 to 11. The following results were obtained.

1) On the whole, water colours and poster colours contained a large quantity of Fe and Pb next to Fe. Especially yellow-2 of water colours contained a large quantity of Pb and showed 1,012.5 μg/g. The dissolved lead was found in water colours that were in lead tubes.

2) The average of urinary Pb of tested children was 6.07±6.67 μg/l(n=15), and that of control children 2.20±2.59 μg/l(n=5). There were not significant difference at levels of 5% between the mean of subjects and that of the control.

3) The average of urinary Cd of subjects was 0.68±0.94 μg/l(n=25), and that of the control 0±0 μg/l(n=5). There were not significant difference at levels of 5% between the mean of subjects and that of the control.

4) The coefficient of correlation between experimental length in years and urinary Pb was 0.98, its regression line being $y_{Pb}=3.18x+2.17(\pm 2.92)$ as y_{Pb} for urinary Pb and x for experimental length in years.

5) The coefficient of correlation between experimental length in years and urinary Cd showed 0.91, its regression line being $y_{Cd}=0.23x+0.11(\pm 0.25)$ as y_{Cd} for urinary Cd and x for experimental length in years.

6) The coefficient of correlation between ages and urinary Pb was 0.10, and that between ages and urinary Cd was 0.72. Urinary Cd was apt to increase in proportion to ages.

FROM MR. ISAAC HUNT MFG. CO.
APRIL 21, 1980

Snell

Foster D. Snell, Inc.

A Subsidiary of
BOOZ • ALLEN & HAMILTON Inc.

800 Dowd Avenue
Elizabeth
New Jersey 07201
(201) 354-8333

Biological Science Laboratories

August 3, 1970

Report to:	Hunt Manufacturing Company
Sample of:	Artist's Paint
Submitted by:	Mr. A. L. Spizzo
Sample Number:	bL 1328
Sample Marking:	Cadmium Yellow Deep Acrylic Artist's Color (6/22/70 C)
Test:	Acute Oral Toxicity (rat) Primary Dermal Irritation (rabbit)
Sample Preparation:	The material was administered as received.
Procedure:	Acute Oral Toxicity. The procedure outlined in the Federal Hazardous Substances Labeling Act, Section 191. 1 (f) (1) was followed. Ten Sprague-Dawley derived rats, with an average body weight of 262 grams were divided into groups of five male and five female rats each. Animals were fasted 18±2 hours but given water ad libitum prior to dosing. Each animal received 5 grams of test material per kilogram of body weight. The animals were observed for mortality, body weight changes, and signs of toxicity for 14 post-dose days.

Procedure: (con't)

All animals were sacrificed and representative rats, one male and one female, were examined grossly at necropsy at the 14th post-dose day.

Primary Dermal Irritation. The procedure described in Section 191.11 of the Federal Hazardous Substances Labeling Act was followed. Irritation to the skin was measured by the patch test technique on the albino rabbit. A total of six healthy New Zealand white rabbits was used to determine the irritation potential of the artist's paint. Each animal received two applications of the test material, 0.5 grams each, one to an intact and one to an abraded skin area clipped free of hair. Surgical gauze (1 inch X 1 inch) secured in place by adhesive tape was used to cover the treated area.

The entire trunk of each animal was then wrapped in rubberized plastic to prevent evaporation of the sample. Contact of the test material with the skin was maintained for 24 hours, after which the plastic and gauze were removed. The treated areas were scored according to the Federal Hazardous Substances Labeling Act, 24 and 72 hours after initiation of the test.

Results:

Acute Oral Toxicity. The ten rats receiving 5 grams per kilogram body weight of Artist's Paint bL 1328 survived the 14-day observation period following compound administration. During this period, all animals gained weight and no alteration in normal behavioral patterns was seen.

A summary of mortality and body weight changes seen during the post-dose observation period is presented. In the animals autopsied, no gross visceral lesions were noted.

Results: (con't)

SUMMARY OF MORTALITY

Dose (gm/kg	Sex	Mortality (# dead/#dosed) 24 Hours	14 days
5	♂	0/5	0/5
	♀	0/5	0/5

SUMMARY OF BODY WEIGHT DATA

Dose (gm/kg)	Sex	---Body Weight in Grams--- Initial	Final	Change
5	♂	271	335	+64
	♀	253	266	+13

Primary Dermal Irritation. The data describing the results of the primary dermal irritation study are summarized in Table 1. A primary irritation index of 0 was calculated for the Artist's Paint bL 1328.

Summary: The Cadmium Yellow Deep Acrylic Artist's Color (6/22/70 C), tested, is not a dermal irritant nor is it a toxic material when dosed orally as described in the Federal Hazardous Substances Labeling Act.

Respectfully submitted,

BIOLOGICAL SCIENCE LABORATORIES

John W. Keating, Ph. D.
Associate Research Director

Table 1. Dermal Irritation: Summary of Skin Responses to Cadmium Yellow Deep Acrylic Artist's Color (6/22/70 C) bl 1328.

Unit and Site	Time (Hours)[1]	Score[2]
Erythema		
Intact Skin	24	0
Intact Skin	72	0
Abraded Skin	24	0
Abraded Skin	72	0
Edema		
Intact Skin	24	0
Intact Skin	72	0
Abraded Skin	24	0
Abraded Skin	72	0
Total		0
Primary Irritation Index		0

[1]hours after application of test material

[2]scores averaged from the readings of 6 rabbits

INDEPENDENCE MALL WEST PHILADELPHIA, PA. 19105, U.S.A. TELEPHONE (215) 592-3000
CABLE ADDRESS: ROHMHAAS TELEX 845-247

FROM A.L. SPIZZO, HUNT MFG. CO.

ROHM AND HAAS COMPANY

February 29, 1980

Dear Customer:

The CIIT (Chemical Industry Institute of Toxicology) is in the process of conducting an inhalation toxicity study on formaldehyde. Results of their preliminary findings are attached. The experiment must be completed and all data thoroughly evaluated before a final assessment can be made. The present ACGIH (American Conference of Governmental Industrial Hygienists) standard for exposure to formaldehyde is a ceiling value of 2 ppm.

Formaldehyde is used as a preservative (usually at 0.05%) in many of our emulsion products. When it is used for this purpose, its presence is reported on our Material Safety Data Sheets. In addition, certain products contain melamine resins or recommend the addition of melamine or urea resins to produce crosslinking reactions. Also, some products have the potential to evolve formaldehyde during curing (i.e. Textile and Nonwovens binders).

Air monitoring has been conducted in various applications areas on products preserved with formaldehyde as well as on products or formulations having the potential for its release. Our results are provided below.

TRADE SALES - PAINT

A "worse case" type room painting study was conducted with a typical emulsion preserved with 500 ppm of formaldehyde. This test was conducted in a closed, unventilated room (11½' x 10' x 9'). Approximately three quarts of the paint formulation containing the emulsion were used to coat the walls. The three quarts of paint contained 0.0903 gm. (or 0.0254 wt. %) of formaldehyde. Atmospheric samples were collected, and analysis showed that the maximum value reached was 0.02 ppm of formaldehyde in the air, well below the ACGIH ceiling value of 2 ppm. These "worse case" data indicate that in applications where relatively small quantities of formaldehyde preserved latex are applied (i.e., caulks, adhesives, floor polishes) or where ventilation is better, values should be even lower than the 0.02 ppm maximum detected in this test.

INDUSTRIAL COATINGS

The Industrial Coatings operations chosen to be monitored were those representing the greatest potential for evolution of formaldehyde. The actual operations were conducted in a manner to maximize formaldehyde concentration in the measured time period. Results of personal monitoring of our laboratory personnel were:

Product	Application	Air Conc. of Formaldehyde (ppm)	Sampling Time (Minutes)
Rhoplex AC-658(1)	Paint - Mixing	0.28	15
Rhoplex AC-658(1)	Paint - Curtain Coating	0.24	20
Rhoplex AC-658(1)	Paint - Cleaning Up	0.24	20
Melamine Formaldehyde Resin	Paint - Mixing, Coating, Baking	0.36	20
Rhoplex AC-1533(2)/ Urea Resin(3)	Giordano Reverse Roll Coater	0.24	20
Rhoplex AC-1024(2)/ Urea Resin(3)	Coating - Mixing, Coating and Baking	0.35 0.28	15 15
Acrysol WS-68(2)	Coating - Mixing; Fast Cure	0.28	15
Acrysol WS-68(2)	Coating - Baking; Fast Cure	0.28	15

(1)Contains a melamine formaldehyde resin
(2)Preserved with formaldehyde
(3)These emulsions recommend the addition of high levels of urea/formaldehyde resin in usage.

All formaldehyde values measured were well below the present standard of 2 ppm.

TEXTILE AND NONWOVENS

Low levels of free formaldehyde may be produced under some heating and curing conditions as a reaction byproduct in some of our textile and nonwovens emulsions.

The following values were obtained during personal monitoring in our Applications Laboratory:

Product	Application	Air Conc. of Formaldehyde (PPM) Operator Sample (Personal)	Headspace Sample (Container)	Area Sample
Rhoplex TR-407	Fiberfill	.07	0.0026	.06
Exp. Emul. E-720/ Glyoxal Resin	Soil Release	.03	0.0012	.08
Rhoplex TR-934	Pigment Printing	.05	0.0016	.06

Product	Application	Air Conc. of Formaldehyde (PPM) Operator Sample (Personal)	Headspace Sample (Container)	Area Sample
Ayrcryl/Exp. Emul. E-1590/E-1583	Film Formation and Foaming	.03	0.0016	.10
Exp. Emulsion E-519/ Melamine Resin	Padded Nonwoven	.04	0.0012	.06
Rhoplex K-14/Primal HPB-971	Hand Swab/Basecoat	.05	0.0016	.08
Rhoplex E-32	Leather Split Finish	.05	0.0016	.08

Based on the above data, we believe that worker exposure to formaldehyde during handling and processing of our Textile and Nonwovens binders should be well below the present standard of 2 ppm.

However, disposable nonwovens or textiles which are not washed before use may be of some concern because a low level of residual formaldehyde may remain in the fabric. Levels can differ depending on curing and processing conditions. Different analytical test methods can also produce different values. Therefore, case by case analysis is required to determine residual formaldehyde in unwashed fabric.

Based on our studies, we believe you should be able to meet the present ACGIH airborne standard of 2 ppm for formaldehyde when handling or using our products. We do not expect your customers who use your materials containing our products to encounter significantly high vapor levels of airborne formaldehyde. However, we recommend that you monitor your own operations to assure that worker exposures are below the ceiling TLV of 2 ppm. We shall be happy to provide you with a procedure for personal monitoring of formadehyde vapors in your plant. Please let me know if you would like a copy.

Very truly yours,

Lois J. Shestack
Polymers, Resins & Monomers, N.A.

LJS:sc
Attachment
(Doc. 2593I)

CHEMICAL INDUSTRY INSTITUTE OF TOXICOLOGY

CIIT

P.O. BOX 12137
RESEARCH TRIANGLE PARK
NORTH CAROLINA 27709
(919) 541-2076

PRESIDENT, LEON GOLBERG, M.D., D.Sc., D.Path., F.R.C.P.(C), F.R.C.Path.
VICE PRESIDENT, DIRECTOR OF RESEARCH, JAMES L. GIBSON, Ph.D.
SECRETARY AND ADMINISTRATIVE MANAGER, DONALD K. HADEL, B.S.

TO: Recipients of this Statement

FROM: Leon Golberg, President

DATE: January 16, 1980

SUBJECT: Long-term Formaldehyde Study

The attached Statement contains substantive information, much of it developed in the course of the last few days. The timing of the release of this information is thus a coincidence, dictated by the exigencies of a situation in which every effort has been made to develop the most critical data within the shortest possible interval following the scheduled 18-month sacrifice of animals in the long-term formaldehyde study.

The meeting with representatives of the Interagency Regulatory Liaison Group on January 17 and 18, 1980 will provide an opportunity to discuss various aspects of the study and to review the available histopathological material stemming from the study. Other individuals or groups wishing to avail themselves of similar opportunities should contact CIIT, so that a suitable time may be set for such a meeting.

LG:evb

Attachment

CHEMICAL INDUSTRY INSTITUTE OF TOXICOLOGY

CIIT

PRESIDENT, ELTON GOLDBERG, M.D., D.Sc., D.P.H., F.R.C., F.R.C.P.(C)
VICE PRESIDENT, DIRECTOR OF RESEARCH, JAMES E. GIBSON, Ph.D.
SECRETARY AND ADMINISTRATIVE MANAGER, DONALD A. HART, B.E.S.

P.O. BOX 12137
RESEARCH TRIANGLE PARK
NORTH CAROLINA 27709
(919) 541 2070

PROGRESS REPORT ON CIIT FORMALDEHYDE STUDIES - 1/16/80

Preliminary findings of an ongoing two-year toxicity study of formaldehyde in rats and mice were reported on October 8, 1979. Rats of all groups, but not mice, had developed sialodacryoadenitis, an epizootic viral infection at 11-12 months. The October 8 statement reported the presence of squamous cell carcinomas arising in the epithelium of the nasal turbinates of 3 rats exposed to 15 ppm formaldehyde for 6 hours/day, 5 days/week for 16 months, but not mice held in the same inhalation chambers. The scheduled eighteen-month sacrifice of animals in this study has now been completed and additional results are available.

The formaldehyde study generally follows a standard CIIT protocol using Fischer 344 rats and B6C3F1 mice, exposed in groups of 120/sex at each of three exposure levels, plus 240/sex controls, for 6 hours per day, five days per week. Groups of animals of both species are exposed concurrently to 15, 6 or 2 ppm of formaldehyde vapor in 5 m^3 stainless steel and glass chambers. Interim sacrifices of small randomly selected groups of animals took place at 6, 12 and 18 months, and histopathologic examination of control and high dose animals is in progress. Observed target organ toxicity in the high-dose animals is used to select corresponding tissues of low and intermediate exposure groups for sectioning and histopathological examination.

A sharp increase in the incidence of squamous cell carcinomas has been noted in rats exposed to 15 ppm formaldehyde between the 16th and 18th month of the study. Many of these tumors were not grossly visible until decalcification and sectioning of the nasal turbinates had been carried out in rats that were moribund or had died spontaneously. A total of 37 nasal carcinomas have now been diagnosed in this group of animals, including 8 such tumors in the 40 rats randomly selected for the 18-month scheduled sacrifice. Morphologically, the tumors range from early squamous cell carcinoma with extensive keratin formation and minimal invasiveness to large, highly invasive squamous cell carcinomas. One of the latter included a small intraluminal area of adenocarcinoma, while another exhibited areas of sarcoma and basal cell carcinoma. Two animals bearing squamous cell carcinomas also had papillomas and one had an adenomatous polyp. Two additional rats had papillomas of the nasal cavity. As noted in the statement of October 8, 1979, one rat exposed to 6 ppm formaldehyde developed a squamous cell carcinoma of the nose. This tumor appears to have arisen from the skin or mucous membrane, without invasion of the turbinates. Additional sections of the nose are being evaluated to establish its site of origin. Additional neoplasms have not been detected in rats exposed to 6 ppm. A small adenomatous polyp has been identified in one of the 40 rats randomly selected from the 2 ppm exposure group for the 18 month sacrifice. No neoplasms of the nasal turbinates have been identified in mice at any of the exposure levels.

Other histopathologic changes were present in the nasal turbinates of rats sacrificed after 18 months of exposure to formaldehyde. Epithelial dysplasia and squamous metaplasia were demonstrated in a large number of rats from all exposure levels, but not in controls. The extent of these lesions was dose-related, with lesions being confined to the anterior portions of the turbinates of 2 ppm animals, to the anterior and middle portions of 6 ppm rats, and throughout the turbinates of the 15 ppm animals. Rhinitis was also associated with formaldehyde exposure in smaller numbers of animals.

These data confirm and extend our earlier observations suggesting that formaldehyde exposures of 15 ppm for 6 hours/day, 5 days/week for 18 months are carcinogenic for rats, but not for mice. Lower exposure levels induce changes in the nasal mucosa ranging from rhinitis to epithelial dysplasia and squamous metaplasia. Further evolution of these changes with continued exposure will be reported on completion of the twenty-four month study.

REFERENCES

1. Seidell, Atherton,
Solubilities of Inorganic and Metal Organic Compounds,
Third Edition, p. 355, 375, 376,
D. Van Nostrand Company, New York (1940)

2. Weast, Robert C., Ed.,
CRC Handbook of Chemistry and Physics,
59th Edition, p. B-260,
CRC Press, West Palm Beach, Florida (1978)

3. Scheller, Walter, and Treadwell, W. D.,
"Determination of Traces of Zinc in Zinc-Cadmium Alloys,"
Helv. Chim. Acta 35, 754-762 (1952),
Chemical Abstracts 46: 7929e (1952)

4. Feitknecht, W., and Reinmann, R.,
"Solubility Product of Cadmium Hydroxychlorides
and of Cadmium Hydroxide," Helv. Chim Acta 34,
2255-2266 (1951); Chemical Abstracts 46: 8936g (1952)

5. Hazleton Laboratories America, Inc., Vienna, Virginia:
"Biological Availability of Cadmium from Cadmium Pigments,"
Report on Projects 895-101 to 895-103 to International
Lead Zinc Research Organization, New York, and to
Dry Color Manufacturers' Association, New York,
September 16, 1977.

6. Dickenson, John,
"Cadmium Pigments in the U.S."
Proceedings of the First International Cadmium Conference,
San Francisco, p. 17 (1977)
Published by Metal Bulletin, London (1978)

7. National Institute for Occupational Safety and Health,
Registry of Toxic Effects of Chemical Substances,
1975 Edition, p. 261

8. "Non-toxic Pigments for Colouring Plastic Articles,"
International Polymer Sciences and Technology 2, p 35 (1975)

9. Mahaffey, Corneliussen, Jelinek, and Fiorins,
"Heavy Metal Exposure from Foods,"
Environmental Health Perspectives pp. 63-69 (1975)

10. Industrial Bio-Test Laboratories, Inc., Northbrook, Illinois:
"Four-day Static Fish Toxicity Studies with Thirteen
Pigments in Rainbow Trout, Bluegills, and Channel Catfish,"
Report No. IBI-621-03883 to Dry Color Manufacturers' Association,
New York, September 24, 1973

11. National Institute for Occupational Safety and Health,
Registry of Toxic Effects of Chemical Substances,
1975 Edition, page ci

12. Statement by Dr. Ruth R. Levine,
Division of Medicine and Dentistry, Boston Unitersity,
Chairman of the Subcommittee on Cadmium as a
Possible Hazardous Air Pollutant of the Science
Advisory Board Executive Committee of the
U.S. Environmental Protection Agency,
at an open meeting of the Subcommittee,
August 9, 1978, EPA, Washington, D.C.

13. Sunderman, F. W.,
"Metal Carcinogenesis in Experimental Animals,"
Food and Cosmetics Toxicology, 9, p. 107 (1971)

14. "The Crimes of Cadmium - Another Installment"
Food and Cosmetics Toxicology 5 p. 411 (1967)

15. Ann. Occup. Hyg. 17 pp. 205-220 (1975)

16. Carcinogen Assessment Group,
"Assessment of Cadmium," Report to EPA,
p. 24, August 1977

17. Friberg, Lars,
"The Toxicology of Cadmium,"
Proceedings of the First International Cadmium Conference,
San Francisco, p. 171 (1977)
Published by Metal Bulletin, Ltd., London (1978)

18. Potts, C. L.,
"Cadmium Proteinuria - the Health of Battery
Workers Exposed to Cadmium Oxide Dust,"
Am. Occup. Hyg. 8 p. 55 (1965)

19. Kipling, M. D., and Waterhouse, J. A. H.,
"Cadmium and Prostatic Carcinoma,"
Lancet 1 pp. 730-731 (1967)

20. Leman, R. A., Lee, J. S., Wagoner, J. K., and Blejer, H. P.,
"Mortality Among Workers Exposed to Cadmium,"
Ann. N. Y. Acad. Sci. 271, 273-279 (1976)

21. Remarks by Dr. Magnus Piscator,
Department of Environmental Hygiene,
Karolinska Institute, Stockholm, Sweden,
at an open meeting of the Subcommittee on
Cadmium as a Possible Hazardous Air Pollutant of
the Science Advisory Board Executive Committee of the
U.S. Environmental Protection Agency, at EPA,
Washington, D.C., August 9, 1978

22. Kjellstrom, Tord; Friberg, Lars; and Piscator, Magnus,
"Mortality and Cancer-Morbidity Among
Cadmium Exposed Workers,"
International Conference on Cadmium,
National Institutes of Health,
Bethesda, Maryland, June 7-9, 1978

23. Kazantzis, G., Flynn, F. V., Spowage, J. S.,
and Trott, D. G.
"Effects of Cadmium in the Kidney -
Results of One Long Term Study,"
Quart. J. Med. 32 pp. 165-192 (1965)

24. Kazantzis, G.,
"Renal Tubular Dysfunction and Abnormalities
of Calcium Metabolism,"
International Conference on Cadmium,
National Institutes of Health,
Bethesda, Maryland, June 7-9, 1978

25. British Occupational Hygiene Society
Committee on Hygiene Standards,
"Hygiene Standard for Cadmium"
Ann. Occup. Hyg. 20 pp. 221-222 (1977)

26. Hughes, Dr. E. G.,
Group Medical Officer,
Johnson, Matthey and Company, London,
private communication, April 10, 1978

27. Slack, J. Warren, Plant Manager,
St. Helena plant, Glidden Pigments Group,
SCM Corporation,
Baltimore, Maryland,
private communication (1977)

[Whereupon, at 4:48 p.m., the hearing was adjourned.]

○