FILE NAME: Johns-Manville (JMA)

DATE: 1941-1957

DOC#: JMA009

DOCUMENT DESCRIPTION: Meeting Minutes - American Standards Association

ASA Minutes of Committee on Allowable Concentrations of Toxic Dusts and Gases, Z-37

Jan. 29, 1941: Previous standards incl. CO, H2S, CS2, benzene. In process: trichlorethylene, perc., formaldehyde, methanol, HF. Many other defense industry chemicals considered for future standards.

Sept. 5, 1941: Diethyl ether, cadmium, tetrachoroethane, acetone 2000 ppm (3000 for 4 hours): manganese 0.6 mg/cum; silica started arsenic 0.15 mg/cum antimony, CCl4 draft circulated to Dow Dup and other companies mercury 0.1 mg/cum; formaldehyde rev. by Barnes, Sterner.

Dec. 11, 1941: Ayides, tetrachoroethane, nitrous gases, cadmium, acetone, diethyl ether, Manganese, xylene, toluene. Formaldehyde subcommittee: Gray, Barnes (Whse), Tebbens (GE). CCl4 subcommittee: von Oettinger, Gray, Irish (Dow), Low (Westvaco). Chromic acid and chromaste, lead, Lead Subcommittee: Neal, Harrold (Chryser), Kehoe, Stratton. Trichlor & perchlor subcommittee: PI Drinker, Low (Westvaco), Army & Navy reps. Methanol subcommittee: Schrenk (later IHF), McCord (Chrysler?), Haggard, Cranch (Union Carbide). Silica subcommittee: Gardner, Cummings, Gray, Hatch, Lanza, Neal.

1942: Arsenic (raised to 1.5 ppm), nitrous gases (Foulger said 50 ppm too high), diethyl ether, xylene, formaldehyde, HF, Pb (0.15 mg/m3), perc, toluene.

1943: Styrene draft prep by D. Irish (Dow): 400ppm. Irish also said 100ppm CCl was ok. formaldehyde: 5-10 ppm. Silica, acrylonitrile, trichlosethylene (200ppm).

1945: Lengthy discussion of MAC's. CCl4 and trichlorethylene (prev. set at 200 ppm "War standard" being reviewed as an American Standard-ASA). Silica (Gardner, Lanza), radon, fluoride, and "new substances" to be considered.

1947: After Gardner's death, Lanza chairs silica subcommitte methyl chloride--looks like 100ppm carbon tetrachloride standard awaiting results of research by Irish (Dow); committee declines to say if standard is for nausea or toxicity prevention and they go with previous recommendation (100 ppm). Cd, Mn, nitroparaffins, Cl2, welding fumes, Be. Drinker wanted to raise arsenic from 0.15 to at least 0.5 for arsenic trioxide. Irish pushed through adoption of styrene war standard of 400 ppm as recommendation. Xylene war standard adopted as ASA standard.

1949: Styrene standard opposed as too high by full committee (5 opposed, 3 not voting, 1 ballot not returned). Then, they agreed there was not enough data to recommend a safe standard and agreed to recommend the American War Standard of 400 ppm as a "tentative" ASA standard. Arsine discussed as highly toxic. Still awaiting Irish's results on carbon tet. Bowditch pushing for 50ppm, Low (Westvaco) insisting 100ppm is "safe." Kehoe

recommended one standard for nausea, another for disease. Welding fumes, fluorides, nitromethane, cyclohexane/cyclohexanol/cyclohexanone, radon, silica, cadmiun briefly discussed. New subcommittee on chlorine, sulfur dioxide. Bloomfield recommends another dozen chemicals for review. Lots of comments on lead compounds submitted by Bowditch with names of some authors and others' comments anonymous.

1954: Carbon monoxide, hydrogen sulfide, carbon disulfide, benzene, cadmium and compounds, manganese and compounds, chromic acid and chromates, mercury and inorganic compounds, arsenic and arsine (Elkins & corporate rep. suggested for subcommittee), toluene and xylene (uncomfortable at 200 ppm but not "unsafe"), lead committee (Bowditch, Foulger, Hazard, Kehoe, Elkins, Pinto) oxides of nitrogen, styrene (100 ppm as "comfort level"), formaldehyde (still recommending 10 ppm despite discomfort and sensitization risk), carbon tetrachloride, methyl chloride, trichlorethylene, acrylonitrile, silica, cyclohexane/cyclohexanol/cyclohexanone/methyl cyclohexane/methyl cyclohexanol/methyl cyclohexanone/nitoethane/2-nitropropane (Kehoe subcommittee). Radium/radon, chorine (2 ppm), fluorine/fluorides, glycols, nitromethane, sulfur dioxide. Decided to recommend standards based on health effects and optionally comment on (dis)comfort levels for same substance below those levels known to cause health effects.

1955: Cadmium oxide fumes, 0.1 mg/cu. meter. No progress on a number of items, including lead. Stokinger involved both here and on TLV committee (he was also in 1954). "Possible" benzene committee: Elkins, Fairhall, Gerarde (Dow), Greenburg, Sands, Schrenck (IHF). "Possible" cadimium dust committee: Baetjer, Gurney, Hardy, Irwin, Prince. Considered for chronic acid/chromates: Baetjer, Machle, Nelson. Suggested for arsenic/arsine: Gray, Morse, Nelson, Pinto, Spolyar. Methanol: Cranch, Elkins, Foulger or Mcallister, McCord, Schrenk. Acrylonitrile: Bradleylor, Shaffer (Amer. Cyanamid), McCormick (Goodrich), "someone from DuPont and Union Carbide." Suggested for fluorine/fluorides: Hodge, Irwin, Largent, Nelson, Stokinger. Suggested for sulphur dioxide: Amdur, Greenwald, Nelson, Pinto or Abersold, Treon, Evans (DuPont). Butadiene rejected as merely an explosion hazard. Beryllium suggested: Eisenbud, Foreman on Shipman, Hardy, Schepers, Sterner (Kodak), Williams. "Maximum allowable concentration" changed to "maximum acceptable concentration." Yant selected as new chairman.

June 20, 1955: Proposed forward, "The meaning of Maximum Acceptable Concentrations." Says "ill effects" only for "hypersensitive individuals." Similar to preface for Threshold Limit Values first published in 1953.

1956: Carbon tetrachloride--formal submittal of proposed standard from USPHS ("endorsing sponsor")--USPHS liason was Stokinger. Formaldehyde--Elkins and McCord quibbled over whether 10 ppm was acceptable or maximum acceptable concentration. "Allergic" reactions dismissed as covered by preamble language about "hypersensitive" people. Oxides of nitogen--5 ppm questioned by Bureau of Mines representative. Foulger objected to a 50 ppm limit for 3-5 minutes as too high. Referred back to Stokinger and subcommittee. Benzene lowered from 100 ppm to 25. Methyl chloroform was most often sold containing "inhibitors" but the group didn't want to even consider "mixtures" (which could be different and proprietary for each manufacturer). Methyl bromide--committee agreed on MAC of 20 ppm, but Stokinger thought 30 would be okay. Chromic acid/chromates--0.1 mg/c.m. suggested for nasal perforation hazard, and Nelson recommended a

statement that this was not intended as protection from lung cancer. Lead--0.2 mg/c.m. for metallic lead and most lead compounds. Some discussion of lead silicate. Acetylene tetrabomide mentioned "2-para-dichlorobenzene" 75 ppm recommended, because the pain level was over 80 ppm (Irish, Dow). Silica--Hatch said highest silicosis dust risks should have a limit of 2 MPPCF. Other discussion on stepwise MAC's based on free silica content. Lanza and Drinker reports considered.

Sponsorship--each individual standard had a sponsoring organization (outside ASA). Autonomous standards committee set up in 1938. Bowditch suggests inviting USPHS and Dept. of Labor, Schrenk suggests American Industrial Hygiene Association. Cralley suggested ACGIH. McCord suggested Industrial Medical Association. IHF also mentioned. Committee chose AIHA to invite as sponsor. Chairman becomes Schrenk; Vice Chair, Irish. Some of these groups simply enabled corporate representatives to be added under more independent and professional sounding classifications.

(11/8/56 comment by Drinker on silica attached at end of 12/6/56 minutes).

1947,1951, 1957 minutes of another committee ("Safety Code for Exhaust Systems").

AMERICAN STANDARDS ASSOCIATION
29 WEST THIRTY-NINTH STREET, NEW YORK

ASA

Z37/52
March 11, 1941

NOT FOR PUBLICATION

M I N U T E S

SECTIONAL COMMITTEE ON STANDARD ALLOWABLE CONCENTRATIONS OF TOXIC DUSTS AND GASES - Z37

January 29, 1941

(Subject to Confirmation)

The meeting was called to order by the Secretary, at 10 a.m. in Room 1101 of the Engineering Societies Building, 29 West 39th Street, New York, N.Y.

Present

Yant, W. P., Chrm.	(Member-at-Large)	Neal, Paul A.	(USPHS)
Foulger, J. H.	(MCA of US)	Sehl, F. W.	(Member-at-Large)
Gray, Albert S.	(CSPHA of NA)	Stratton, Reuel C.	(AICE & ACSE)
(Alternate for Stanley H. Osborn)		vonOettingen, W.F.	(Member-at-Large)
Hamilton, Alice	(Dept.Lbr.)	Watson, C. H.	(Member-at-Large)
Johnston, John	(Member-at-Large)	Whiting, S. E.	(NAMC Cos.)
McCord, Carey P.	(AA of IP&S)		

Ainsworth, Cyril, Recording Secretary
Chapman, G. H., Alternate, National Association of Mutual Casualty Cos.
Rogers, J. S., Alternate, U. S. Department of Labor
Snell, M. A., Alternate, Association of Casualty and Surety Executives

Absent

Adams, James M.	(API)	Haggard, Howard W.	(Member-at-Large)
Bloomfield, J. J.	(APHA)	Hatch, Theodore F.	(Member-at-Large)
Bowditch, Manfred	(IAGLO)	Henderson, Yandell	(Member-at-Large)
Drinker, Cecil K.	(Member-at-Large)	Lanza, A. J.	(Member-at-Large)
Drinker, Philip	(Member-at-Large)	Paine, Walter S.	(NSC)
Gardner, Leroy Y.	(Member-at-Large)	Selby, C. D.	(Member-at-Large)
Greenburg, Leonard	(IAIABC)	Vosburgh, B. L.	(Member-at-Large)

25. Approval of Minutes. No objections being raised, it was assumed that the minutes of the meeting of the sectional committee of June 3, 1940, were duly approved as circulated.

26. Resignation of R. R. Sayers. The Secretary announced that under date of September 26, 1940 (Z37/37), Dr. Sayers had presented his resignation as Chairman of the committee because his duties as Director of the U. S. Bureau of Mines would not permit him sufficient time to continue. Subsequently he had found it necessary to resign as a member of the committee.

Upon motion by Mr. Whiting, seconded by Dr. Neal, it was unanimously

RESOLVED

that the Sectional Committee on Allowable Concentrations of Toxic Dusts and Gases - Z37 record its appreciation of Dr. Sayers' conduct of its affairs and meetings during his term as Chairman and offer its thanks to him for his efficiency and fairness as its presiding officer.

As Chairman of the committee during the early and difficult period of its organization, and during the formulation and completion of the first four standards which it had approved, Dr. Sayers contributed unsparingly of his time and energy to the promotion and interest of the work.

RESOLVED

that there be spread upon the minutes and communicated to Dr. Sayers, the U. S. Public Health Service and the American Public Health Association, this expression of warm appreciation of Dr. Sayers' services and the regret of the members of the committee on his resignation as Chairman and as a member of the committee.

27. Election of Officers (Z37/38). The Secretary reported that under date of October 14, 1940 the Chairman had appointed the following Nominating Committee to make nominations for Chairman and Vice Chairman of the committee: Dr. A. S. Gray, Chairman, Mr. Philip Drinker and Dr. Alice Hamilton. Members had been requested to forward their nominations for these offices to the chairman of the Nominating Committee.

Dr. Gray presented the report of the Nominating Committee which had been based upon the nominations received from committee members and unanimously approved by his committee.

In accordance with the recommendations of the Nominating Committee, and upon motion by Mr. Stratton, duly seconded, it was unanimously

VOTED

that Mr. William P. Yant be elected Chairman, and Dr. C. D. Selby, Vice Chairman.

Following the election, Mr. Yant took the Chair.

28. Subjects for Standardization under ASA Defense Emergency Procedure - PR 34d.1 (Min. 22) . The Secretary announced that the standards for Carbon Monoxide, Hydrogen Sulfide, Carbon Disulfide and Benzene, had recently been approved by the ASA as American Standards. He recalled that the necessity for completing these standards in the least possible time, in view of the national defense program, had been repeatedly mentioned. The Committee might therefore wish to reexamine its program to determine which of the proposed standards would be most needed by industries manufacturing defense materials, and make plans for their early completion.

He called attention to the Defense Emergency Standards Procedure which had recently been approved by the ASA in order to expedite the development and approval of standards which would be needed in the national defense program. A similar procedure had been developed and approved by the British Standards Institution and was now being used to develop emergency standards. These standards had increased the efficiency of the production of war materials.

The Chairman said that drafts had been developed on six of the twelve substances selected by Dr. Selby's subcommittee following the meeting of the committee last June. Drafts on the following substances had not, as yet, been completed for circulation to the committee: Trichlor ethylene, Tetrachlor ethylene, Formaldehyde, Toluol, Methanol and Hydrofluoric Acid. The committee might wish to consider these with other substances on which standards would be needed in the defense program.

During the very full discussion, the following substances were mentioned as being in use in industries manufacturing materials for the defense program: Toluol, Xylol, TNT, Cyanide, Dinaphthyl, Manganese, Cadmium, Dinitrobenzene, Tetryl, Lead Azides, Nitroglycerine, Nitrated Glycos, Alcohol, Ether, Acetone, and Phenol.

Finally it was agreed that the Chair should appoint a subcommittee to select a list of substances from those which had been mentioned and report back at the afternoon session of the meeting concerning its recommendations. The Chairman appointed Dr. Hamilton, Chairman of the Subcommittee, with Dr. Gray, Dr. Neal and Mr. Whiting as members.

Later in the meeting Dr. Hamilton presented the report of the subcommittee which had been unanimously approved.

In accordance with the recommendations of the subcommittee, and upon motion by Mr. Stratton, seconded by Dr. Foulger, it was unanimously

RESOLVED

that in view of the national defense emergency program under which many industries are being called upon to manufacture and use toxic substances, the Sectional Committee on Allowable Concentrations of Toxic Dusts and

Gases - Z37 is of the opinion that standard allowable concentrations for such substances should be established at the earliest possible date.

RESOLVED

that the committee recommend to the American Standards Association that standards on the following substances be developed under the Emergency Standards Procedure (PR 34 d.1):

Acetone
Azides, Lead and Sodium
Cadmium
Ether
Manganese
Tetryl
TNT
Xylol

The recommendations of the subcommittee were also approved in regard to the appointment of the following members of the sectional committee to serve as Emergency Technical Committees under the Emergency Standards Procedure to develop the drafts:

Acetone - Dr. Carey P. McCord
Azides, Lead and Sodium - U. S. Public Health Service
Cadmium - Dr. Cecil Drinker
Ether - Dr. Howard W. Haggard
Manganese - U. S. Public Health Service
Tetryl - Dr. John Foulger
TNT - U. S. Public Health Service
Xylol - Dr. Leonard Greenburg

29. General Policies Concerning Form and Content of Proposed Standards (Min. 17). Mr. Stratton was of the opinion that the material which had been included in Section II of the various drafts previously developed should have been arranged in a specific order. He suggested that a detailed form for this section be followed in drafting all subsequent standards.

Following discussion, and upon motion by Dr. Johnston, seconded by Mr. Stratton, it was unanimously

VOTED

that a uniform listing be adopted for the properties of substances set forth in Section II of the proposed standards.

The Chairman appointed a subcommittee consisting of Mr. Stratton, Chairman; Dr. McCord and Dr. von Oettingen to develop a proposed form to be used in listing the properties in Section II of the various drafts.

Later in the meeting, Mr. Stratton, Chairman, presented unanimous recommendations of his subcommittee as follows:

"that Section II of all standards developed by this committee be drafted in the following form:

"Section II Properties of - - - - - - - -

2.1 A concise description of lay characteristics.

2.2 Chemical formula
Molecular weight
Specific Gravity
Melting point
Boiling point
Vapor pressure
Vapor density
Solubility
Flash point
Ignition temperature
Explosive limits

(The above order to be maintained)

2.3 A concise description of the toxicological features.

(No headings to appear for 2.1, 2.2, 2.3)"

Mr. Stratton stated that in formulating the list of properties for paragraph 2.2, his subcommittee wanted it understood that each drafting committee would determine which of the properties would be included in the draft; the properties selected as being appropriate to be listed in the order suggested by the subcommittee's report.

Upon motion by Dr. Johnston, seconded by Dr. Gray, it was unanimously

VOTED

that the recommendations of the subcommittee in regard to the form for Section II be approved.

The Secretary reported that Dr. Selby had raised a question concerning the contents of Section V on Analytical Methods in the proposed standards now before the committee and had stated in a letter, dated January 24, 1941, that he was inclined to question the desirability of being so specific with respect to certain analytical methods.

The Chairman said that the committee would have to decide whether it should designate only one research method or whether two

or three methods should be included if it was decided they would produce dependable results.

Dr. Foulger thought it would be best to suggest one or two analytical methods which had been known to be reliable instead of making certain specific methods standard.

After full discussion, and upon motion by Dr. Johnston, duly seconded, it was unanimously

RESOLVED

> that the committee should not include in any standard mandatory requirements for specific analytical methods of determining the amount of toxic substances present in the atmosphere, but should include in standards suggestions for the most desirable methods to be followed.

Mr. Stratton said that while he favored the action concerning the section on analytical methods, he thought the section on sampling in the proposed standards should include definite practical methods to be followed from which plants and companies could select the best applicable method for their own conditions.

Dr. Johnston suggested that it might be desirable to make the sections on sampling uniform in the various drafts. He thought that the sampling and analytical methods could be put in a single section to show their relationship.

The Chairman was of the opinion that it would be desirable to include certain specific suggestions which would insure that the sampling would be adequate.

Dr. Foulger thought that a reasonable time limit over which samples should be taken might well be included in the section on sampling.

At the conclusion of the discussion on this point, the Chairman appointed a subcommittee composed of Dr. Johnston, Chairman, Dr. Foulger and Mr. Sehl to review Section IV on Sampling and make recommendations for the improvement of the wording of the requirements in the section.

Following the luncheon period, during which the subcommittee met, Dr. Johnston reported that while his subcommittee had reached a tentative agreement on recommendations concerning the section on sampling, its final report would be submitted to the full sectional committee for review and approval.

The following proposals were discussed at some length by the members present at the meeting and were agreed to, in most cases by formal action of the committee:

1. In all drafts of standards the word "maximum" should be used instead of "maximal"; and the word "concentration" should be given in the singular instead of in the plural.

2. In all drafts of standards the title of Section III should be "Permissible Concentration".

3. In all drafts of standards paragraph 3.1 should contain the maximum allowable concentration in parts per million and in milligrams per liter instead of giving the milligrams per liter in a footnote as has been previously decided. Paragraph 3.1 would therefore read as follows:

> The maximum allowable concentration of - - - - - - - - - shall be - - - - parts per 1,000,000 parts of air by volume, corresponding to - - - - mg. per liter at 25 C and 760 mm pressure, for exposures not exceeding a total of 8 hours daily.

4. In all drafts of standards the allowable concentration should be given on a basis of 8 hours daily exposure. (This should be shown in accordance with the wording for paragraph 3.1 given above.)

30. Proposed American Standard Allowable Concentration of Lead (Z37/50). The Chairman mentioned the fact that the committee might have time to discuss only one or two of the preliminary drafts which had been circulated because so much time had been taken to discuss standards which would be needed in the national defense program and general policies covering the form and content of standards. He suggested that the drafts on lead and mercury be discussed, if time permitted.

Mr. Stratton opened the discussion by questioning whether the proposed standard on lead should, in addition to metallic lead, also cover certain forms or all forms of lead. He thought that the lead compounds to which the allowable concentration would apply should be specifically listed, but it might not be essential to give the properties of all the compounds that would be included.

The Chairman said he could see good reason for putting in certain properties that would show the tendencies of substances to contaminate the air.

Dr. McCord said that a large number of industries were using soluble lead salts.

Mr. Whiting raised the question of whether the greatest exposure would not be from lead oxides. He thought it would be necessary to include lead compounds in the proposed standard.

Dr. Foulger wondered whether the committee would wish to place lead silicate and lead acetate in the same category.

Dr. Hamilton did not think this could be done unless a separate code would be developed for each lead compound. It would be very difficult to write a standard covering all lead compounds as they differed so widely in toxicity.

Dr. Johnston was of the opinion that in writing an allowable concentration for lead, there was not much use in discussing organic lead and not the compounds.

The Chairman inquired whether the committee would want to limit this standard to metallic lead and lead oxides. Consideration might also be given to the following: lead azides; carbonates, including basic carbonates; acetates, including basic acetates; and white lead.

Dr. Neal did not think white lead should be included in the proposed standard.

After full discussion concerning the various lead compounds and whether or not they should be covered in the proposed standard, it was agreed that the standard on lead should include metallic lead and lead oxides, acetates, carbonates, nitrates, chlorates, and basic sulphates.

During the discussion concerning Section II, Dr. McCord suggested that paragraph 2.1 should contain the information that lead gave off noxious and poisonous vapors far below its measurable vapor pressure point or its boiling point. It was agreed that this suggestion should be followed in revising paragraph 2.1.

Dr. Hamilton suggested that the relative danger of absorption of lead through the mouth or by inhalation should be stated in paragraph 2.2 as this was a vital point. It was agreed that paragraph 2.2 should be revised to include this suggestion and might be reworded somewhat as follows:

> "The absorption of lead, whether through the lungs or the alimentary canal, may produce acute gastro-intestinal symptoms, nervous symptoms and blood changes, depending upon the quantities absorbed. Inhalation appears to be the most dangerous avenue of entrance."

The question of whether or not the proposed standard should include lead arsenates was discussed at some length. It was suggested, however, that this substance might well be covered in a separate standard since the hazard from the use of lead arsenate occurred in widely diversified industries, such as the fruit industry and manufacturing plants. In conclusion, it was agreed that a separate standard on the subject of lead arsenate was needed and that this question should be presented to the committee at its next meeting for consideration.

31. Additions to Membership (Min. 1). The Secretary announced that the American Welding Society had requested membership on the sectional committee.

After discussion, it was agreed that it would not be to the best interests of the project as a whole to accord representation on the committee to any organization which might be interested in only a few of the large number of standards which would be developed. Representation on the committee should be confined to those organizations and individuals who had a broad interest in the complete program of work. It was recognized, however, that the American Welding Society, as well as other technical and commercial groups, would be interested in one or more of the standards which would be developed. It was agreed that an opportunity should be given to interested organizations to review the draft standards and send representatives to the meetings of the committee to present their points of view.

Upon motion by Mr. Stratton, seconded by Mr. Whiting, it was unanimously

RESOLVED

that copies of all draft standards developed by the committee be sent to the American Welding Society for review, comment and criticism; and

that the American Welding Society be cordially invited to send a representative to sectional committee meetings to present its points of view on those proposed standards in which it is interested.

The Chairman called attention to the broad research program on toxic substances which was now being carried on by the U. S. Bureau of Mines and the Keough Laboratories. He was of the opinion that this important research work would be of value to the program of the committee. It would therefore be desirable to invite these organizations to appoint representatives on the committee.

Upon motion by Dr. McCord, seconded by Dr. Gray, it was unanimously

VOTED

that the American Standards Association be requested to invite the U. S. Bureau of Mines and the Keough Laboratories to become members of the Sectional Committee on Allowable Concentrations of Toxic Dusts and Gases - Z37.

Mr. Stratton suggested that in the interest of promoting the use of the standards developed by the committee among state departments of labor and state health authorities as the basis of state regulations, the members of the sectional committee, particularly those representing governmental groups, in consulting with state authorities should urge the adoption of the American Standards developed by this committee.

In this connection, the Secretary requested all members of the committee to advise the ASA concerning any proposed state regulations covering allowable concentrations of toxic dusts and gases. This would enable the ASA to urge the adoption of American Standards as the basis of these proposed state regulations.

The Secretary called attention to the importance of giving manufacturers of the substances which would be covered in the proposed standards, full opportunity to present comments and criticisms on the proposed allowable concentrations. Many manufacturers would have this opportunity through the Manufacturing Chemists' Association which was now represented on the committee by Dr. Foulger. In other cases, manufacturers would be contacted directly by the ASA office.

32. Announcement of Changes in Personnel. The following changes had taken place since the approval of the personnel in July, 1939:

American Petroleum Institute
Dr. James M. Adams appointed representative
Mr. H. N. Blakeslee appointed alternate

American Public Health Association - Hygiene Section
Mr. J. J. Bloomfield appointed representative vice Dr. R. R. Sayers

Association of Casualty and Surety Executives
Mr. M. A. Snell appointed alternate vice Mr. F. W. Sehl

Manufacturing Chemists' Association
Dr. John H. Foulger appointed representative

National Safety Council

Mr. R. L. Forney appointed alternate vice Mr. W. D. Keefer

Public Health Service - Federal Security Agency
Dr. Paul A. Neal appointed representative vice Dr. R. R. Sayers

U. S. Department of Labor
Mr. J. S. Rogers appointed alternate vice Dr. E. J. Stieglitz

Members-at-Large
Dr. Edgar Layer resigned
Dr. Eugene L. Opie resigned

33. Adjournment. The meeting adjourned at 4 p.m., subject to the call of Chair.

CYRIL AINSWORTH
Recording Secretary

Reported by
A. Burke
D. Borlby

AMERICAN STANDARDS ASSOCIATION
29 WEST THIRTY-NINTH STREET, NEW YORK

ASA

Z37/53
March 11, 1941

To the Members of the Sectional Committee on
Allowable Concentrations of Toxic Dusts and Gases:

Proposed revision of Sections on
Sampling and Analytical Methods

Attached is the report of the Subcommittee on Sampling, composed of Dr. Johnston, Chairman, Dr. Foulger and Mr. Sehl, appointed by the Chairman at the recent meeting of the sectional committee to develop a revision of the section on sampling for future drafts of proposed standards.

In submitting this report, Dr. Johnston has written as follows:

> "The sub-committee, appointed at the meeting on January 29 of the Sectional Committee on Allowable Concentrations of Toxic Dusts and Gases - Z37 to report on a preferred wording for the section, in the ASA Standards, relating to sampling procedure, submits the attached statement which it recommends unanimously. It also is unanimous in recommending (although this is beyond what it was asked to do) that the statements on sampling procedure and on analytical methods be two parts of a single section, in recognition of their close interdependence; and in suggesting that the statement relative to analytical methods, be a general one along the lines indicated in the attached report. It is to be noted that either paragraph d' or d" would be used depending upon what X is."

This report is being circulated to the committee in accordance with Minute 29 which reads in part as follows:

> "......Dr. Johnston reported that while his subcommittee had reached a tentative agreement on recommendations concerning the section on sampling, its final report would be submitted to the full sectional committee for review and approval..."

It is requested that members of the committee file their comments or approval of this proposed section by March 28, 1941. It will be assumed that members who do not reply by that time are in favor of the attached report.

In the meantime, this section may be included in drafts which have been developed by members of the committee, but if the committee votes to change the Section on Sampling and Analytical Methods, such sections in proposed standards will be revised to meet the decisions of the committee.

CYRIL AINSWORTH
Recording Secretary
Sectional Committee - Z37

DB

Encl. Section IV. Sampling Procedure and Analytical Methods

Section IV. Sampling Procedure and Analytical Methods

4.1 The sampling procedure is to be in accordance with what experience shows is necessary to secure a sample which is truly representative of the actual working conditions at the location tested; this implies that the taking of the sample does not of itself alter these conditions. Attention is directed to the following points:

(a) Samples of air shall be taken wherever there is a known or suspected source of air-borne X.

(b) Samples shall be taken at the breathing level, close to mouth or nose, of the worker, with special attention to locations near the source of the dust or fume and in the path of air currents carrying it towards the worker if such a condition exists.

(c) Samples shall be taken in sufficient number to show up whatever differences in concentration exist during the working period.

[In the case of dusts]

(d') The rate at which the sample of air is drawn into the impinger or other test apparatus shall not exceed 30 litres per minute; the volume of the sample should be as small as is compatible with the precision of the analytical method employed, and the time required for withdrawal of a single sample should in general not exceed one hour.

[In the case of fumes or vapors]

(d") The rate at which the sample of air is withdrawn into the test apparatus shall not in general exceed 10 litres per minute; the volume of the sample should be as small as is compatible with the precision of the analytical method employed, and the time required for withdrawal of a single sample should in general not exceed one hour.

[It is understood that a fifth paragraph may be included to cover any special case - for instance, if a properly checked and controlled continuous recording procedure should be applicable.]

4.2 The analytical methods commonly used for this purpose are based on (here a brief general description, e.g. a colorimetric or photometric comparison); full details are given in the references cited below. Any other analytical procedure may be used provided that its applicability and reliability have been established."

AMERICAN STANDARDS ASSOCIATION
29 WEST THIRTY-NINTH STREET, NEW YORK

Z37/69 ASA
September 5, 1941

NOT FOR PUBLICATION

M I N U T E S

EXECUTIVE COMMITTEE OF THE

SECTIONAL COMMITTEE ON STANDARD ALLOWABLE CONCENTRATIONS OF TOXIC DUSTS AND GASES - Z37

July 29, 1941

(Subject to Confirmation)

The meeting was called to order by W. P. Yant, Chairman at 10 a.m. in Room 903, Engineering Societies Building, 29 West 39th Street, New York, N. Y.

Present

Yant, W. P., Chairman (Member-at-Large)
Hamilton, Alice (Dept.Lbr.)
Johnston, John (Member-at-Large)
McCord, C. P. (AA of IP&S)
Neal, P. A. (FSA-Pub.Health Ser.)
Schrenk, H. H. (U.S.Bur.Mines)
Selby, C. D. (Member-at-Large)
Stratton, R. C. (AICE & ACSE)

Ainsworth, Cyril, Secretary (ASA staff)
Drinker, Philip (Member-at-Large Z37 Sec. Com.) School of Public Health, Harvard University
McKee, Dr. Ralph W., School of Public Health, Harvard University
Rogers, J. S., (Alternate representative U. S. Dept. Labor, Z37 Sec. Com.) Division Labor Standards
Sterner, Dr. James H., Laboratory of Industrial Medicine, Eastman Kodak Company
Watson, Dr. C. H. (Member-at-Large Z37 Sec. Com.) American Telephone and Telegraph Company

1. Appointment of Executive Committee (Z37/58 and 59). The Chairman announced that as a result of a letter ballot to the sectional committee under date of June 17, 1941, the committee had unanimously approved the appointment of an Executive Committee to "(1) Initiate work on new subjects, especially those needed in the defense program; (2) Select and invite members of the sectional committee or other individuals to develop draft standards on the subjects selected; and (3) Review drafts prepared by members of the sectional committee to determine whether they are in order for consideration by the full committee." He had therefore appointed the following as members of the committee: Alice Hamilton, John Johnston, C. P. McCord, P. A. Neal, H. H. Schrenk, C. D. Selby and R. C. Stratton. He was gratified that all members of the committee could be present at this meeting since there were a number of matters to come before the committee as evi-

denced by the agenda. He honed the Executive Committee might be the means of expediting the work on this project. However, it was not intended to subordinate the sectional committee in any way, but to use this smaller group as a steering or working committee to speed the program of work which was now broadening rapidly as would be seen from the fact that fourteen proposed standards were now before the committee for consideration. Many of the actions of the Executive Committee would have to be ratified by the sectional committee and final action on all standards would remain in the hands of the sectional committee. All the actions of the Executive Committee would be subject to review by the sectional committee.

2. Status of Emergency Standards Under Development. The Secretary reported on the status of various standards now being developed under the Emergency Procedure of the ASA.

(a) Diethyl Ether. A proposed American Defense Emergency Standard Allowable Concentration of Diethyl Ether had been prepared by Dr. H. W. Haggard in accordance with the request of the sectional committee, and circulated for comment and criticism under date of May 28, 1941. Members of the sectional committee had been requested to send in their comments by June 16, 1941, and replies had been received from twenty members; seven members not replying, which had indicated that they favored the proposals in the draft. Of the twenty members who had submitted comments, only two serious objections had been received, both concerning the proposed allowable concentration; one from the U. S. Public Health Service and one from Dr. Foulger, representing the Manufacturing Chemists' Association. Following completion of the canvass of the committee, a digest of the comments had been prepared and sent to Dr. Haggard for review in accordance with the procedure. Dr. Haggard had revised the draft to take care of a few editorial corrections and had written to the U. S. Public Health Service in reply to their inquiry concerning the basis of the concentration which he had included in the draft. He had selected the value of 400 parts per million since his research had shown that the amount of ether inhaled at this concentration did not produce any detectable changes in behaviour and could not cause any impairment of health. This figure had also been chosen as a suggested value by the states of Massachusetts and California. After careful consideration, the U. S. Public Health Service had decided to approve this figure with the understanding that the concentration would be subject to correction as soon as more information would be available. Dr. Foulger, however, had asked that the issuance of the standard be delayed until he could obtain information from various companies manufacturing smokeless powder, the process of which required the greatest use of ether in the present defense program. He had advised the ASA office that this information would be obtained as soon as possible and would be forwarded for consideration. Up to the present time it had not been received although the proposed standard had been held up since June 23, the date on which the revised draft had been received from Dr. Haggard.

Dr. Neal said that the Public Health Service would recommend the value of 400 ppm until they found evidence from research they were

now carrying on that another value would be preferable. A standard on this substance was definitely needed since it seemed entirely possible that accident proneness could be caused from concentrations above this figure and Dr. Haggard had certainly arrived at this proposed concentration after much study.

Mr. Stratton stated that the exposure in smokeless powder plants was from alcohol ether mix. Since Dr. Foulger represented an organization which had in its membership a large number of manufacturing companies directly concerned with the manufacture of this material, his objection, although the only one now recorded, would seem to warrant some consideration.

Following discussion, and upon motion by Mr. Stratton, seconded by Dr. Johnston, it was unanimously

VOTED

that Dr. Foulger be requested to confer with Dr. Haggard concerning the data which had been collected from the plants now manufacturing smokeless powder relative to the concentrations of ether in which employees are now working; and that Dr. Foulger be requested to present whatever data was now available and additional data which he could obtain within the next month so that final consideration could be given the proposed emergency standard early in September.

(b) Acetone. The Chairman stated that since several people outside the committee had come to the meeting in order to discuss the proposed defense emergency standard on this subject, he wished to bring it before the committee at this time.

The Secretary said that this was one of eight subjects which had been selected by a special committee and approved by the sectional committee at its meeting on January 29, 1941, for development as an emergency standard. Members of the sectional committee who had attended the meeting had ample opportunity to discuss the various subjects which had been selected and other members who had not been at the meeting had been at liberty to object to any of the subjects selected when they reviewed the minutes. However, no objections had been received and Dr. McCord had been requested to develop a draft standard on this subject. The first draft had been circulated to the sectional committee under date of June 20, together with a memorandum containing a discussion by Dr. McCord on the subject. Fourteen members of the committee had sent in comments and several comments had been received from organizations and individuals outside the sectional committee. Various minor corrections had been suggested in sections 2, 4 and the bibliography. Only two serious objections had been received concerning the allowable concentration from committee members: one from Mr. Paine, representing the National Safety Council who had suggested using the higher figure of 1000 ppm for eight hours exposure; and the other from Messrs. Cecil and Philip Drinker, Members-at-Large, who had

stated that the concentrations shown in the draft were, in their opinion, much too severe, and urging that the development of a standard on this subject be postponed until much needed data could be obtained. Following receipt of this letter, Mr. Drinker had submitted comments from a number of people whose opinions he had solicited; most of whom agreed with his points of view. Mr. Drinker was now present at the meeting to discuss this subject and would offer data to support his points of view.

Mr. Drinker referred to a letter which he had received from Dr. Foulger, a member of the sectional committee, supporting his points of view. This correspondence, together with correspondence from Dr. H. L. Barthelemy, Chief Chemist of the Tubize Chatillon Corporation of Rome, Georgia, manufacturers of viscose and acetate rayon products, had been filed with the ASA office. He understood that Dr. Cranch of the Industrial Toxicology Department, Carbide and Carbon Chemicals Corporation, who produced large quantities of acetone, had submitted a letter suggesting that the proposed limits would be unnecessarily restrictive, and that if it was necessary to set a standard, 1000 and 2000 ppm would seem more in order.

Mr. Drinker introduced Dr. Ralph W. McKee from the Laboratory of the Harvard School of Public Health who was working with him on a study of the harmful effects of acetone. Dr. McKee presented data concerning experiments which had been conducted and which had failed to show any particular abnormal effects from exposure to acetone. These studies would be continued and experiments made with animals in the laboratory and with men working in plants to determine the rate at which acetone was absorbed and eliminated on exposure to known concentrations.

The Chairman then introduced Dr. James H. Sterner of the Laboratory of Industrial Medicine, Eastman Kodak Company, who presented data obtained from the study of men working with acetone in their company. These studies had not revealed any toxicity from acetone, nor had their experience ever shown any harmful effects from exposure to this substance, Dr. Sterner reported. This same result had been obtained from studies made in the Tennessee Eastman Plant.

In reply to a question from the Chairman, Dr. Sterner said that new workmen had reported a feeling of intoxication until after they had worked in the plant about three months. Men in the Eastman plant worked in concentrations from 1500 to 2000 ppm for four hours daily.

Dr. Selby questioned Dr. Sterner concerning the sickness rates during the period of his study. Dr. Sterner had no definite information on this point but thought the men had been fairly healthy.

Dr. Schrenk wondered about the accident records. Were the workers under such conditions more accident prone?

Dr. Neal said he believed the most important thing was performance and coordination among workers exposed to this substance. The Public Health Service had received a large number of inquiries concerning the toxicity of acetone.

Dr. McCord said that the information which had been presented at this meeting was the result of the circulation of the proposed standard which result he had hoped to obtain. The figures used in the draft which he had prepared had been based on high concentrations for short periods of time. He had, however, worked in industries where people had been exposed to high concentrations up to 4000 ppm and he had not observed any toxic conditions.

There followed a general discussion on the need for a standard on this subject. While those present had no information which would show a proved case of acetone poisoning, it seemed to be the consensus of opinion that the wider use of the substance, particularly in the explosive industry during the present emergency, had created a need to establish a figure which would be acceptable and would serve for protection against toxic effects in high concentrations for long periods as well as protection against accidents caused by the intoxicant effects of the substance.

Finally, after a very full discussion, and upon motion by Dr. McCord, seconded by Dr. Selby, it was

VOTED

that the maximum allowable concentration of acetone in the proposed standard be revised to 2000 ppm for eight hours daily exposure and 3000 ppm for four hours daily exposure.

Dr. Neal requested that his vote be deferred.

Upon motion by Dr. Neal, seconded by Mr. Stratton, it was unanimously

VOTED

that the published figures of the U. S. Bureau of Mines for the explosive limits of acetone, 2.55 to 12.8 be included in the list of properties in paragraph 2.2.

After further discussion, it was agreed that the term "Fl_u" as shown in paragraph 2.2. should be deleted.

It was agreed that all editorial corrections should be referred to Dr. McCord for preparation of a final draft.

Dr. Johnston proposed the inclusion of a paragraph to be put at the end of the present paragraph 2.2. Later in the meeting

he presented a definitely worded paragraph for consideration.

Upon motion by Mr. Stratton, duly seconded, it was unanimously

VOTED

that the following paragraph be included in paragraph 2.2 in the proposed standard on acetone:

Acetone as used in industry often contains impurities in small quantity. These affect some of the values listed above, and may influence both the physiological effects and the result of the analytical procedure. Acetone is frequently admixed with other volatile materials.

It was agreed that paragraph 2.2 should have the following title: "Properties of Pure Acetone."

It was further agreed that a paragraph and title similar to the ones approved for the proposed standard on acetone, should be included in drafts of other proposed standards where applicable.

(c) Cadmium. The Secretary reported that the development of this proposed emergency standard had been approved by the sectional committee; and the first draft had been prepared by the U. S. Public Health Service. It had been circulated, under date of June 20, 1941, to the sectional committee for comments and criticism. Eleven members of the committee had sent in comments on the draft; almost entirely favorable. A few editorial corrections had been suggested, but no one had raised any objection to the allowable concentration. The comments received would be referred to the Public Health Service for consideration in preparing the final draft to be submitted for approval as an American Defense Emergency Standard.

Dr. McCord suggested that the analytical methods should include reference to the use of a polaragraph.

Dr. Schrenk said that they had found cadmium determinable by a polaragraph and that a spectograph could be used.

After discussion, it was agreed that since the term "polaragraph" referred to only one particular device, it would be desirable to include a general reference to this type of equipment. Finally, it was agreed that the following phrase should be added to the first sentence of paragraph 4.2:

"Or by suitable dropping mercury electrode procedure."

In conclusion, it was agreed that since the canvass of the sectional committee had shown that a national consensus existed on

approval of the proposed emergency standard, it should be referred back to the Public Health Service for final revision, and submitted to the ASA for approval as an American Defense Emergency Standard.

Later in the meeting it was decided that the note referring to the allowable concentration in paragraph 3.1 should read as follows:

"NOTE: It is customary to express the concentration of metal fumes, oxides or salts in milligrams per ten cubic meters."

(d) Manganese. The draft on this proposed emergency standard had not, as yet, been circulated for comment and criticism, but had been held for discussion and review at this meeting as a means of expediting its completion. The Public Health Service had prepared the preliminary draft of this standard.

After discussion, the following revisions in the draft were agreed to:

Section I

SCOPE AND PURPOSE

1.1 Add the words "and fumes" after the word "dust" (this to apply throughout the draft).

1.2 Make the same correction as in 1.1.

Section 2

PROPERTIES OF MANGANESE

2.1 Add the words "as ferro manganese" after the first word in the second sentence. Change the third sentence to read as follows: "Manganese is a constituent of certain alloys." Change the final sentence to read "Manganese dioxide is used in the manufacture of dry cells, in the paint industry and in the ceramic industry."

2.2 It was suggested that a reference to the atomic weight be added in the bibliography instead of using the date "1940" in parenthesis following the property.

Section 3

PERMISSIBLE CONCENTRATION

3.1 Change this paragraph to read "The maximum allowable concentration of manganese dust and fumes shall be 60 milligrams of manganese per 10 cubic meters of air. (2)*"

The note referred to by the asterisk following this paragraph should read "It is customary to express the concentration of metal fumes, oxides or salts in milligrams per ten cubic meters." This wording should be used in other drafts where the concentration had been given in milligrams per ten cubic meters instead of parts per million parts of air.

Section 4

SAMPLING PROCEDURE AND ANALYTICAL METHODS

No changes suggested.

It was agreed that this draft should be circulated to the sectional committee and any other interested organization or individuals for comment and criticism as a proposed American Defense Emergency Standard.

3. New Emergency Standards Proposed for Development. The Chairman reported that he had received definite information to the effect that emergency standards were needed on the toxicity of fumes from heavy metals such as arsenic, antimony and zinc. He had written to several members of the committee in an attempt to verify this information and had been advised that these standards were among those needed in the defense effort. Among the members contacted was the Public Health Service, who had advised him that they had sufficient data on which standards covering these subjects could be based. Subsequently the Public Health Service was requested to develop preliminary drafts on arsenic and antimony which they had now accomplished.

Following a brief discussion, and upon motion by Dr.Johnston, seconded by Mr. Stratton, it was unanimously

RESOLVED

that the Chairman be commended for his initiative in requesting the U. S. Public Health Service to develop the proposed emergency standards on arsenic and antimony;

RESOLVED

that the Sectional Committee on Allowable Concentrations of Toxic Dusts and Gases - Z37 be requested to recommend to the American Standards Association that standards on the following subjects be developed under the ASA Emergency Standards Procedure:

Arsenic
Antimony
Zinc

In anticipation of a favorable response from the sectional committee and the ASA concerning the proposed development of the emergency standards, the committee reviewed the preliminary drafts on arsenic and antimony which had been prepared by the U. S. Public Health Service, and recommended that the following revisions be made in the drafts pending circulation for comment and criticism:

(a) Arsenic. There was considerable discussion concerning the scope of the proposed standard on arsenic. It was suggested that the standard might include lead arsenate. Finally, however, it was agreed that the scope of the proposed standard should be limited to arsenic as a metal and arsenic trioxide.

It was agreed that the properties of the arsenic oxides should be added under paragraph 2.2.

Following discussion, it was agreed that paragraph 3.1 should read as follows:

> "The maximum allowable concentration of metallic arsenic and arsenic trioxide shall be 1.5 milligrams of arsenic per 10 cubic meters of air."

The following wording should be included as an explanation of the reason for giving the allowable concentration in milligrams per ten cubic meters instead of parts per million:

> "It is customary to express the maximal permissible concentration of metal fumes, oxides or salts in milligrams per ten cubic meters."

It was agreed that if the development of this proposed standard under the emergency procedure was approved, the draft as amended at this meeting should be circulated to the sectional committee for comment and criticism.

(b) Antimony. Following a brief discussion it was agreed that paragraph 1.1 should be revised to read as follows:

> "The standard allowable concentration of antimony either as metal or oxide applies to all places of employment."

It was agreed that the properties of the oxides should be added to paragraph 2.2.

After discussion, it was agreed that the symptoms of poisoning from antimony should be included in paragraph 2.3 instead of the statement "The symptoms of antimony poisoning are similar to those produced by arsenic."

Upon motion by Dr. Johnston, seconded by Dr. Selby, it was unanimously

VOTED

that paragraph 3.1 of the proposed draft on Antimony be revised to read as follows:

"The maximum allowable concentration of antimony as a metal or oxide shall be 1.5 milligrams of antimony per 10 cubic meters of air."

It was also agreed that the following paragraph should be included as a footnote to paragraph 3.1:

"It is customary to express the maximal permissible concentration of metal fumes, oxides or salts in milligrams per ten cubic meters."

If the development of this proposed standard under the emergency procedure was approved, the draft as amended at this meeting should be circulated to the sectional committee for comment and criticism.

Upon a request from the Chair, Dr. Neal said that the Public Health Service would revise these two drafts as indicated by the discussion at this meeting and would develop the preliminary draft of the proposed standard on zinc.

4. Proposed Emergency Standards on which Data Was Not Available. The Secretary said that the development of proposed standards on lead and sodium azides, TNT and tetryl had been approved by the sectional committee; and the committee had recommended the development of these standards under the ASA Emergency Standards Procedure. The Public Health Service had been requested to develop the proposed standards on lead and sodium azides and TNT; and Dr. Foulger has been requested to develop the draft on tetryl.

After investigating the subject, Dr. Foulger had reported that the data available on tetryl covered only skin exposure and that it would be impossible to draft a proposed allowable concentration of dust or vapors from this compound unless more research would be done on the subject. He would, however, be willing to develop a preliminary draft, including such data as was available on the action of the compound on the skin.

Dr. Foulger's letter concerning this proposed standard had been referred to the Chairman who had recommended that a draft be developed, based on the action of the compound on the skin; and, if desirable, that research be recommended covering the inhalation of dust or vapors from this compound. This recommendation had been re-

ferred to Dr. Foulger but he had not, as yet, submitted a draft on this proposed standard.

Dr. Neal had reported in a letter that the Public Health Service had been conducting animal experiments on the toxicity of lead azide pertaining to its oral administration. They were not, however, prepared to make any final statement concerning its toxicity. However, it would seem that lead azide by oral administration would be somewhat more toxic than some of the other lead compounds. They had no studies under way on the toxicity of sodium azide. From its industrial use, it would appear that very few hazards were connected with this material since it had only been used as an intermediate in the manufacture of lead azide. In regard to a possible standard allowable concentration of TNT in air, sufficient information was not available in literature to allow even a tentative appraisal of such hazards. It appeared to be the consensus of opinion that the main route of absorption of TNT was the skin. This problem had been complicated further by the fact that different brands of TNT would show considerable variations in their toxicity depending upon the degree of their contamination with other nitro compounds. The Public Health Service had prepared an extensive review of this subject which would soon be published.

Dr. Neal said that he would recommend delaying the development of standards on these subjects until more information concerning them would be available.

Finally, after discussion, it was unanimously agreed that the Executive Committee request the Sectional Committee on Allowable Concentrations of Toxic Dusts and Gases - Z37 to recommend to the ASA that the development of standards on lead and sodium azide, TNT and tetryl under the ASA Emergency Standards Procedure be discontinued; and that development of these proposed standards be held in abeyance pending action by the sectional committee based on the availability of additional data on these subjects.

5. Proposed Standards Now Under Development. The Chairman said that a number of revised drafts and two preliminary drafts of proposed standards were now ready to be circulated to the sectional committee for comment and criticism. It had been thought advisable for the Executive Committee to review these drafts in order to expedite their consideration by the sectional committee when they were circulated. The drafts on Nitrous Gases, Tetrachlorethane, Carbon Tetrachloride, Mercury, Chromium and Lead had all been circulated to the sectional committee previous to its last meeting. It had been hoped to discuss these drafts at that meeting, but there had not been sufficient time. Only the draft on Lead had been discussed in detail. However all the drafts had been revised since the meeting in accordance with decisions made by the sectional committee. The revised drafts were now, he hoped, in fairly good shape.

(a) Nitrous Gases. The revised draft on Nitrous Gases which had been prepared by Dr. McCord, was discussed at some length, particularly in regard to the proposed allowable concentration of 70 ppm for nitrogen dioxide (NO_2) and 20 ppm for nitric oxide (NO).

Following full discussion, upon motion by Dr. Johnston, seconded by Dr. Neal, it was unanimously

VOTED

that the proposed standard be revised to cover only nitrogen dioxide (NO_2), and that the allowable concentration be set at 50 ppm.

Following revision, it was agreed that the draft should be sent to letter ballot of the sectional committee for approval.

(b) Tetrachlorethane. Dr. Hamilton said that since developing the drafts of this proposed standard she had found that tetrachlorethane was not being used to any extent in the present emergency. While this substance had been widely used in the previous world war, its use had almost completely been replaced by other less dangerous substances. Other members of the committee concurred in this opinion.

After discussion and upon motion by Mr. Stratton, seconded by Dr. Schrenk, it was unanimously

VOTED

that the Executive Committee recommend to the Sectional Committee on Allowable Concentrations of Toxic Dusts and Gases - Z37, that completion of the proposed standard on tetrachlorethane be held in abeyance until some contingency arrived where there seemed to be a need for it.

(c) Carbon Tetrachloride. In the review of this proposed standard there was no objection raised to the allowable concentration. It was agreed that a reference to the formation of phosgene as mentioned in paragraph 2.2 should be included in the bibliography. (This referred to a paper on the formation of phosgene by Mr. Yant).

It was also agreed that the draft should be circulated to the sectional committee prior to discussion at a meeting; and that comments and criticisms on the draft should be solicited from the following: Dow Chemical; DuPont; Westvaco; Pyrene; and rubber manufacturers.

(d) Mercury. During the discussion there was very little criticism of this proposed standard; none relating to the allowable concentration. It was agreed that the following changes should be made before the draft would be circulated to the sectional committee prior to discussion at a meeting:

2.2 Delete solubility of HgO as the standard covered only Hg.

2.3 Add the words "psychic irritability" before "predominating" in the last sentence.

3.1 This paragraph to read: "The maximal allowable concentration of mercury shall be 1 milligram per 10 cubic meters of air." A note referring to the allowable concentration to be added at the bottom of the page reading: "It is customary to express the maximal permissible concentration of metal fumes, oxides or salts in milligrams per ten cubic meters."

It was also suggested that a paragraph might be included giving the places where exposures to the substance most often occur.

(e) Chromium. There was a full discussion concerning the scope of this proposed standard. It was agreed finally that the draft should cover chromic acid and chromates.

The following revisions in the draft were agreed to:

1.1 and 1.2 Delete the word "and" following "mist".

2.1 This paragraph to be revised to include the characteristics of chromic acid and chromates - two common alkali chromates such as sodium and potassium dichromates.

2.3 Change second sentence to read: "Contact of the skin or mucous membrane with the dust or solution of soluble chromates or dichromates may cause dermatitis and ulcers."

3.1 Change the word "oxide" to "anhydrite". The concentration to be checked to make sure it applies.

After the discussion it was agreed that this proposed standard should be revised and circulated to the sectional committee prior to discussion at a meeting.

(f) Lead. After a brief discussion, it was agreed that the following changes should be made in the draft of the proposed standard before it was circulated prior to its consideration by the sectional committee at a meeting:

2.3 Revise the first sentence to read: "The absorption of lead in sufficient quantities either through the lungs

or the gastro-intestinal tract may produce acute gastro-intestinal symptoms, nervous symptoms and blood changes."

4.2 The phrase "dropping mercury electrode" to be added in the first sentence following "Spectrographically or by means of".

(g) Formaldehyde. The preliminary draft of this proposed standard had been developed by Dr. Gray and received only a short time before this meeting. It had not, therefore, been circulated for comment and criticism.

After a short discussion, it was agreed that the draft should be circulated to the sectional committee for comment and criticism and to such other groups as might be interested, including Westinghouse Electric and Manufacturing Company for the attention of Mr. E. C. Barnes, Industrial Hygiene Engineer. Dr. Sterner, who was present as a guest, volunteered to review the draft and send in comments on it.

(h) Toluene. Dr. Greenburg had just completed the preliminary draft of this proposed standard which had not, as yet, been circulated for comment and criticism. Because of insufficient time, the draft was not reviewed in detail. It was agreed that it should be circulated to the sectional committee for comment and criticism.

6. Appointment of Subcommittee to Check Chemical and Physical Data. The Chairman said that various members of the committee had discussed the problem of selecting the chemical and physical properties of the various substances in order to meet the opinions of all members of the sectional committee, other interested organizations and individuals. As the members would recall, the sectional committee had previously voted that such material should be taken from the International Critical Tables unless later and more authoritative information was available. However, the Critical Tables listed a number of values for each property and thus many of the controversies had arisen concerning the proper figure to be used in the drafts which had delayed completion of the proposed standards. It had been suggested that a subcommittee be appointed to check the chemical and physical properties in final drafts of standards where any of the values had been questioned.

After discussion, this suggestion was agreed to and the Chairman requested Dr. Johnston and Mr. Stratton to form this editing subcommittee. These gentlemen accepted the assignment.

7. Development of Proposed Standard on Silica. The Chairman questioned whether the committee wanted a standard on silica. He had received a request from the National Electrical Manufacturers Association to put the question of developing standards for clay dust before the sectional committee; and the ASA office had been corresponding with western organizations, both state and industrial, who had made inquiries concerning high concentrations of dusts caused by the operations of crushers and pulverizers.

The Secretary said that this subject among others had been selected for standardization by the sectional committee at its meeting on August 7, 1939, upon recommendation of the Subcommittee on Plan and Scope. All of the other subjects selected at that time, ie. lead, mercury, toluol, etc. had now been assigned to various members for the development of drafts. It might be well to have silica assigned to a member particularly interested in the subject, or to a subcommittee of several interested members.

Mr. Stratton remarked that he thought the committee was ready to consider a report on the subject since there were a number of codes in existence now on the subject of silica that might be used as a starting point for the work of this committee.

Finally, following a brief discussion, and upon motion by Mr. Stratton, seconded by Dr. Schrenk, it was unanimously

VOTED

that the Chairman be authorized to appoint a subcommittee to study silica and other dusts and develop a preliminary standard for consideration by the committee.

8. Development of Drafts on Subjects Previously Assigned. The Chairman mentioned that there would be an effort made to have all drafts completed which had been assigned; or if it was not possible for the members who had been assigned the duty of preparing the drafts to fulfill their assignments, other members would be requested to accept such assignments.

Mr. Drinker who was present at the meeting as a guest, said that he would try to complete the drafts on trichlor ethylene and tetrachlor ethylene at an early date.

The Secretary was requested to contact Mr. Bowditch to determine whether or not he could prepare the preliminary draft standard on hydrofluoric acid.

The Chairman requested Dr. Schrenk to accept the assignment of the preparation of a draft standard on methanol. Dr. Schrenk indicated that he hoped to be able to accept the assignment.

9. Adjournment. The meeting adjourned at 6 p.m., subject to the call of the Chair.

CYRIL AINSWORTH
Recording Secretary

DB

AMERICAN STANDARDS ASSOCIATION
29 WEST THIRTY-NINTH STREET, NEW YORK

ASA

Z37/91
December 11, 1941

NOT FOR PUBLICATION

REPORT OF ACTIONS TAKEN BY

SECTIONAL COMMITTEE ON ALLOWABLE CONCENTRATIONS OF TOXIC DUSTS AND GASES - Z37

December 11, 1941

(Subject to confirmation)

The meeting was called to order by the Chairman at 10 a.m., in Room 517 of the Engineering Societies Building, 29 West 39th Street, New York, N.Y.

Present

Yant, W.P., Chrm.	(Member-at-Large)	Lanza, A.J.	(Member-at-Large)
Foulger, J.H.	(MCA of US)	McCord, Carey P.	(AA of IP&S)
Gardner, Leroy U.	(Member-at-Large)	Neal, Paul A.	(USPHS)
Gray, Albert S. (Alternate for S.H.Osborn)	(CSPHA of NA)	Paine, Walter S.	(NSC)
		Schrenk, H.H.	(U.S.Bur.Mines)
Greenburg, Leonard	(IAIABC)	Stratton, R.C.	(AICE & ACSE)
Hamilton, Alice	(Dept.Lbr.)	Tebbens, B.D. (Representing B.L.Vosburgh)	(Member-at-Large)
Johnson, A.B.	(War Dept.)		
Johnston, John	(Member-at-Large)	Whiting, S.E.	(NAMC Cos.)

Ainsworth, Cyril, Recording Secretary
Bedwell, R. C. (Captain), Medical Corps, U.S. Army
Cranch, A. G., Representing American Welding Society
Gehrmann, C. H., duPont Company
Shaw, John S., Hercules Powder Company

Absent

Adams, James F.	(API)	Hatch, Theodore F.	(Member-at-Large)
Bloomfield, J.J.	(APHA)	Henderson, Yandell	(Member-at-Large)
Bowditch, Manfred	(IA&LO)	Selby, C. D.	(Member-at-Large)
Drinker, Cecil K.	(Member-at-Large)	Sehl, F. W.	(Member-at-Large)
Drinker, Philip	(Member-at-Large)	von Oettingen, W.F.	(Member-at-Large)
Haggard, Howard W.	(Member-at-Large)	Watson, C. H.	(Member-at-Large)

34. Approval of Minutes. Upon motion by Mr. Paine, seconded by Dr. Gray, it was unanimously

VOTED

that the minutes of the meeting of the committee of January 29, 1941, be approved as circulated.

35. Report on Recommendations of the Executive Committee. The Secretary reported that the Executive Committee had met on July 29, 1941 and had voted to recommend various actions to the sectional committee:

(a) Proposed American Defense Emergency Standards on Arsenic, Antimony and Zinc. The letter ballot vote of the sectional committee on the question of developing these standards under the ASA Emergency Standards Procedure had resulted in 23 affirmative, 4 negative and 1 ballot not returned. Messrs. Cecil Drinker, Philip Drinker, Theodore Hatch and S. E. Whiting had voted in the negative. Mr. Manfred Bowditch had not returned his ballot. Mr. F. W. Sehl had voted in the affirmative, but had questioned whether a standard should be developed on zinc. Dr. Cecil Drinker had been the only member submitting reasons for his negative vote.

Following a very detailed and lengthy discussion concerning the need for developing standards on these subjects, and Dr. Drinker's comments in connection with his negative vote, upon motion by Dr. Greenburg, seconded by Dr. Gray, it was unanimously

VOTED

that the Chairman be authorized to appoint a subcommittee to investigate the desirability of developing emergency standards on arsenic, antimony and zinc, and make recommendations to the sectional committee for its consideration; and

that no request for the development of such proposed emergency standards be made to the American Standards Association pending the report of the subcommittee.

Upon motion by Dr. Foulger, seconded by Dr. Gray, it was unanimously

VOTED

that the subcommittee just authorized be composed of not less than three members of the sectional committee, of which at least one member should be industrially interested in the development of studies of the subjects under consideration.

Upon motion by Dr. Foulger, seconded by Mr. Paine, it was unanimously

VOTED

that the Subcommittee on Arsenic, Antimony and Zinc be composed of the following members:

P. A. Neal, Chairman
Cecil K. Drinker
Carey P. McCord

Upon motion by Mr. Paine, seconded by Dr. Neal, it was unanimously

VOTED

that the Chairman, with the advice of the Executive Committee, be authorized to appoint subcommittees to consider subjects which might be suggested for the development of standards under this project.

(b) Proposed American Defense Emergency Standards on Lead and Sodium Azides, TNT and Tetryl. The vote of the sectional committee by letter ballot on the question of discontinuing the development of standards on these subjects under the ASA Emergency Procedure and holding them in abeyance pending receipt of additional data, had resulted in 27 affirmative ballots and 1 ballot not returned. Mr. Manfred Bowditch had not returned his ballot.

During the brief discussion it was mentioned that draft standards on these subjects would not be developed until additional technical information was available.

(c) Proposed American Defense Emergency Standard on Tetrachlorethane. It would be recalled that Dr. Hamilton had developed an initial draft of this proposed standard which had been circulated for comment and criticism. Subsequently Dr. Hamilton had advised the Executive Committee that since developing the draft she had found that tetrachlorethane was not being used to any extent in the present emergency and had been almost completely replaced by other less dangerous substances. The Executive Committee had therefore recommended that the completion of the standard be held in abeyance until it was found to be needed. The vote of the sectional committee by letter ballot on the recommendation of the Executive Committee had resulted in 26 affirmative, 1 negative and 1 ballot not returned. Dr. Leonard Greenburg, representing the International Association of Industrial Accident Boards and Commissions had voted in the negative but had given no reason for his vote. Mr. Manfred Bowditch had not returned his ballot.

Dr. Hamilton remarked that this substance was really not important at the present time and, although it was known to be poisonous, there was no definite data available to establish allowable limits.

Dr. Greenburg stated that the reason he had voted in the negative had been because he had no definite evidence that the standard should not be completed.

Following discussion, and upon motion by Dr. Foulger, seconded by Mr. Paine, it was unanimously

VOTED

that should the subcommittees entrusted with the task of considering the advisability of developing new standards reach the decision that standards were not desirable because of lack of sufficient information, the decision be reported to the sectional committee for consideration; and

that if the sectional committee concurred in the decision of the subcommittee, such action be reported to the American Standards Association with the recommendation that the decision be given the same publicity as would be given to standards which had been completed.

(d) Proposed American Standard Allowable Concentration of Nitrous Gases. The Executive Committee had considered a revision of the proposed standard on nitrous gases and had recommended additional revisions. Several drafts had been developed of this proposed standard and the Executive Committee had believed that the forthcoming draft would be in readiness to be voted upon by the sectional committee. In accordance with the committee's recommendation the revised draft would therefore be sent to letter ballot of the sectional committee for approval and recommendation to the ASA.

(e) Appointment of Subcommittee to Check Chemical and Physical Data. Following discussion at the Executive Committee meeting, the Chairman had appointed Dr. Johnston and Mr. Stratton to serve as a subcommittee to check the chemical and physical properties given in the various proposed standards when any of the values were questioned, and to arrange all such data in a uniform method.

The Secretary reported that Dr. McCord had raised the question of standardizing the form in which bibliographies were given in the proposed standards.

After discussion, and upon motion by Dr. Foulger, duly seconded, it was unanimously

VOTED

that this subcommittee also be authorized to set up the bibliographies appearing in the proposed standards in accordance with the form used in the Chemical Abstracts of the American Chemical Society.

(Later in the meeting the question of properly editing the proposed drafts was discussed. It was agreed that Dr. Johnston and Mr. Stratton be requested to add editing to their duties in order that the proposed standards might be kept uniform.

36. Report on Status of Proposed Emergency Standards (Min. 28). The Secretary reported on the status of the proposed emergency standards as follows:

(a) American Defense Emergency Standard Allowable Concentration of Cadmium - Z37.5-1941. This standard had been approved by the ASA on November 2, 1941. Copies would be available within a short time and would be sent to members of the committee.

ASA Note: Subsequently under date of December 17, 1941, the above standard was mailed to members, alternates and cooperating organizations on the sectional committee.

(b) Proposed American Emergency Standard Allowable Concentration of Acetone (Z37/73). Dr. McCord had developed the preliminary draft of this proposed standard which had been circulated for comment and criticism to the sectional committee in June, 1941. Three members had objected to the allowable concentration. These objections had been considered at the meeting of the Executive Committee in July, 1941. Representatives of manufacturers of materials, principally rayon, which involved the use of large quantities of acetone, had been present at the Executive Committee meeting and had offered objections to the proposed concentration and challenged the need for the establishment of a standard. The Executive Committee had decided that a revised draft should be prepared, incorporating certain revisions agreed upon at the meeting.

The sectional committee had voted as follows on the proposed revised draft: 6 affirmative; 18 negative; 2 not voting; 2 ballots not returned.

Following a short discussion, it was agreed that the vote of the committee by ballot would prevail.

(c) Proposed American Emergency Standard Allowable Concentration of Diethyl Ether (Z37/55). Dr. Haggard had been assigned the development of the preliminary draft which had been circulated to the sectional committee for comment and criticism under date of May 28, 1941. 20 members of the committee had commented on the draft by June 16, with only two registering objections: The U. S. Public Health Service had questioned the basis of the proposed concentration and had later decided to approve the draft with the understanding that the standard would be revised as soon as more information was available; and Dr. Foulger had raised objections to the development of the standard as well as the concentration and had requested that it be held in abeyance until he could obtain information from various companies manufacturing smokeless powder.

The proposed draft and objections had been discussed at the meeting of the Executive Committee in July, 1941, and the committee had voted to request Dr. Foulger to confer with Dr. Haggard concerning the data which he was collecting from the manufacturing companies. Copies of subsequent correspondence had been circulated to the sectional committee under dates of September 10, 1941 (Z37/71) and November 18, 1941 (Z37/76).

The need for such a proposed standard was discussed at considerable length. Finally, upon motion by Dr. Foulger, seconded by Mr. Whiting, it was unanimously

VOTED

that the proposed standard and comments received be referred to a subcommittee for consideration and recommendations to the sectional committee.

The Chairman said he would appoint Dr. Neal, Dr. Foulger and Dr. Haggard to the subcommittee.

(d) Manganese (Min. 28). The Secretary reported that the first draft of the proposed American Defense Emergency Standard Allowable Concentration of Manganese (Z37/68) had been circulated to the committee for comment and criticism under date of August 22, 1941. After several follow-up letters, twenty-two members and two alternate members of the committee had replied; while five members had not replied. Eight organizations and individuals outside the committee had been canvassed upon request from committee members. Comments had been received from several of these groups. It was planned to send all comments to the U. S. Public Health Service for consideration in revising the draft. It it was found that no extensive revisions would be necessary, the report of the canvass, together with the revisions made by the Public Health Service, would be forwarded to the Safety Code Correlating Committee for recommendations on approval. In case the Public Health Service would make extensive revisions in the draft, the revised draft would again be circulated to the committee.

(e) Proposed American Emergency Standard Allowable Concentration of of Xylol. Dr. Greenburg had prepared a preliminary draft of the proposed standard on xylene (xylol) which would be circulated to the committee for comment and criticism as soon as the canvass had been completed on the proposed manganese standard.

The committee discussed various types of questionnaires which might be circulated with proposed emergency standards to expedite replies.

It was finally agreed that a questionnaire similar to those used by the National Safety Council in circulating drafts of Safe Practices Pamphlets and Industrial Data Sheets, should be prepared for use in obtaining comments and criticisms on this proposed draft.

37. Proposed American Standard Allowable Concentration of Toluene (Min. 5). Dr. Greenburg said that since he had prepared the preliminary draft of this proposed standard, the New York Department of Labor had carried on extensive work in connection with this substance, having examined some 200 workers in one of the airplane plants in the state. He now believed that the proposed concentration could reasonably be raised without endangering the health of workers. He requested that the draft be referred back for revision before being circulated.

Following a brief discussion, and upon motion by Dr. Foulger, seconded by Mr. Stratton, it was unanimously

VOTED

that the proposed draft be referred to a subcommittee for consideration, revision and recommendation to the sectional committee.

NOTE: Subsequent to the meeting, the Chairman appointed the following subcommittee: Dr. Greenburg, Chairman; Dr. Adams, Dr. Neal and Dr. Schrenk.

38. Proposed American Standard Allowable Concentration of Formaldehyde. Dr. Gray had developed the preliminary draft of this proposed standard which had been circulated to the sectional committee on November 27, 1941 (Z37/80) with a request for comments and criticism. Very few comments had been received prior to the meeting, but those on record were presented by the Secretary.

Following a brief discussion, it was agreed that the draft of the proposed standard, together with comments presented, should be referred to a subcommittee composed of Dr. Gray, Chairman; Messrs. E. C. Barnes (Westinghouse), and B. D. Tebbens (General Electric). A Revised draft would be prepared and circulated for comment and criticism.

39. Proposed American Standard Allowable Concentration of Carbon Tetrachloride. The Secretary reported that in accordance with the discussion at the Executive Committee meeting held last July, the U. S. Public Health Service had again revised the draft of this proposed standard which had been circulated to the committee and others for comments and criticism on November 27, 1941 (Z37/81). A number of comments had been received and while there had been no objections to the allowable concentration, it would seem desirable that other criticisms be considered.

After discussion, and upon motion by Mr. Paine, seconded by Mr. Whiting, it was unanimously

VOTED

that the Chairman be authorized to appoint a subcommittee to study the revised draft

and the comments received, and to prepare a final draft for consideration of the sectional committee.

It was agreed that if the subcommittee could resolve all controversial points with unanimous agreement, upon completion of its investigations the final draft of the standard should be sent to letter ballot of the sectional committee for approval and recommendation to the ASA as American Standard.

NOTE: Subsequent to the meeting the Chairman appointed the following subcommittee: Dr. von Oettingen, Chairman; Dr. Gray; Dr. D. D. Irish (Dow Chemical Company, Midland, Mich.), Mr. F. S. Low (Westvaco Chlorine Products Corp., New York City).

40. Proposed American Standard Allowable Concentration of Mercury. The Secretary reported that the latest revision of the draft of this proposed standard had been circulated to the committee on November 27, 1941 (237/82). Only one member had sent in comments - Dr. Haggard had suggested under date of December 1, 1941:

"In the draft on mercury, it might be advisable to state also the vapor pressure at some temperature higher than 20 degrees to emphasize the rapid rise in vapor pressure with summer temperature.

"In section 2.3 of the same draft the opening sentence seems to me a little awkward. Could it not start: 'Mercury may enter the body by.....'?"

Each of these points was discussed, and without formal motion it was agreed that the suggestions should be incorporated in a revised draft.

Upon motion by Mr. Stratton, duly seconded, it was unanimously

VOTED:

that with the changes agreed upon, the proposed standard be sent to letter ballot of the sectional committee for approval and recommendation to the ASA for approval as American Standard.

41. Proposed American Standard Allowable Concentration of Chromic Acid and Chromates. The Secretary said that the latest revised draft of this proposed standard had been circulated to the committee on December 3, 1941 (237/84).

There was considerable discussion concerning what information or material should be included in paragraph 2.2. It was finally agreed that paragraph 2.2 should start with the fourth sentence of

paragraph 2.1 in the draft under discussion. Instead of including the properties of pure chromium, chromic acid anhydride, potassium chromate and potassium dichromate as in the draft under discussion, a paragraph similar to the following should be included:

> "The principle compounds of chromium to which this code pertains are chromic acid anhydride, potassium chromate and dichromate, sodium chromate and dichromate, ammonium chromate, calcium chromate, etc. The physical and chemical properties of chromic acid and chromates may be found in standard text books."

It was also suggested that the purpose of the standard as given in 1.2 might include "or dust from chromates of alkali or alkaline earth".

It was agreed that members of the committee should be given further opportunity to submit comments since the draft had not been circulated sufficiently in advance of the meeting to permit detailed study.

Upon motion by Dr. Greenburg, duly seconded, it was unanimously

VOTED

> that, following the revisions as suggested, and in the event no further comments are received, the revised draft be submitted to letter ballot of the sectional committee for approval and recommendation to the ASA for approval as American Standard.

12. Proposed American Standard Allowable Concentration of Lead (Min. 30). The Secretary reported that the latest revision of this proposed standard had been circulated to the committee on December 3, 1941 (Z37/85). A few comments had been received from Mr. G. E. Behr of the National Lead Company. These were presented to the committee.

Following lengthy discussion concerning whether a general standard, such as the present draft dealing with all lead compounds, should be completed; or whether a number of standards should be developed dealing with the various compounds, grouped according to their toxicity; upon motion by Dr. McCord, seconded by Dr. Foulger, it was unanimously

VOTED

> that the scope of the present standard under consideration be limited to lead, lead oxides and hydrated lead oxides.

Upon motion by Dr. Neal, seconded by Dr. McCord, it was unanimously

VOTED

that with the revisions necessary to comply with the restricted scope, the proposed standard be submitted to letter ballot of the sectional committee for approval and recommendation to the ASA for approval as American Standard.

Upon motion by Mr. Paine, seconded by Dr. Neal, it was unanimously

VOTED

that the Chairman be authorized to appoint a subcommittee to consider other lead compounds from the viewpoint of preparation of standards - those compounds selected as having the same toxicity as covered by the present standard to be included in a revision of that standard; others to be developed into separate standards.

NOTE: Subsequent to the meeting the Chairman appointed the following subcommittee: Dr. Neal, Chairman; Dr. Gordon C. Harrold (Industrial Hygiene Laboratory, Chrysler Corporation), Dr. R. A. Kehoe (Kettering Laboratory of Applied Physiology, University of Cincinnati), and Mr. Stratton.

43. Status of Work on Subjects Selected for Proposed Standards (Min.22). The Secretary reported on the status of the various subjects which had been selected for proposed standards and assigned to members of the committee for development.

(a) Trichlor Ethylene and Tetrachlor Ethylene. Mr. Philip Drinker had been requested to develop preliminary draft standards on these subjects, but because of the heavy pressure of his work had been unable to do so. He had recently suggested in a letter that preparation of the draft might be assigned to someone else.

After discussion, it was agreed that since these substances were of considerable interest, it would be well to set up a subcommittee to determine whether or not standards should be developed on these subjects; and to produce drafts or reports, depending on its decision. It was further agreed that Mr. Philip Drinker should be requested to act as chairman, with Mr. F. S. Low (Westvaco Chlorine Products Corporation), Captain R. C. Bedwell (Medical Corps, U. S. Army) and a representative of the Navy Department to comprise the subcommittee.

(b) Methanol. Dr. Schrenk had accepted the responsibility for developing a preliminary draft on this substance. It was suggested that a subcommittee might assist him in this work and the Chairman was authorized to appoint such a subcommittee.

NOTE: Subsequent to the meeting the Chairman appointed the following subcommittee: Dr. H. H. Schrenk, Chairman; Dr. C. P. McCord, Dr. H. W. Haggard and Dr. A.G.Cranch.

(c) Hydroflouric Acid. Mr. Manfred Bowditch had been requested to develop a preliminary draft standard on this substance but he had not replied to the request.

Discussion brought out the fact that a large amount of this acid was being used in connection with aluminum welding and in the manufacture of stainless steel. A number of states had also adopted limits for this substance.

Finally, upon motion by Mr. Stratton, seconded by Dr. Gray, it was unanimously

VOTED

that this subject be referred to a subcommittee to study the desirability of formulating a standard on hydroflouric acid and report to the sectional committee on its findings.

NOTE: Subsequent to the meeting the Chairman appointed the following subcommittee: Mr. Manfred Bowditch, Chairman; Dr. Willard Machle (Kettering Laboratory of Applied Physiology, University of Cincinnati), Dr. F.C. Frary (Director of Research, Aluminum Company of America), and Mr. Underwood (International Salt Company).

(d) Silica and Other Dusts. Dr. Gardner, who had been requested to develop a preliminary draft on silica, presented a memorandum on the subject which had been approved by Dr. Lanza and Dr. Sayers.

After full discussion of whether or not it would be possible to formulate a standard at this time, it was agreed that the Chairman should appoint a subcommittee to develop a report, similar in content to a report previously prepared for the Air Hygiene Foundation by a committee of which Dr. Lanza had been Chairman. It was also agreed that this report should be presented in a form similar to the standards being developed by this sectional committee, though without the preciseness to which drafts now under consideration had been held. This report might later be used as the basis of a standard.

NOTE: Subsequent to the meeting the Chairman appointed the following subcommittee: Dr. Gardner, Chairman; Dr. Donald H. Cummings (University of Colorado Medical School), Dr. Gray, Dr. Greenburg, Mr. Theodore Hatch, Dr. Lanza and Dr. Neal.

44. Additions to Membership (Min. 31). The Secretary presented a request from the International Acetylene Association for membership on the sectional committee. After discussion, it was agreed that this request might well be treated in the same manner as the previous request of the American Welding Society, in that both these organizations, while definitely interested in some of the substances under discussion, would not be interested in the broad program of the committee.

Upon motion by Dr. Johnston, seconded by Dr. Gardner, it was unanimously

RESOLVED

that copies of all draft standards developed by the committee be sent to the International Acetylene Association for review, comment and criticism; and

that the International Acetylene Association be cordially invited to send a representative to sectional committee meetings to present its points of view on those proposed standards in which it is interested.

The Secretary mentioned that Dr. A. G. Cranch had been suggested as a representative for the International Acetylene Association. The Chairman suggested that since Dr. Cranch had broad experience as an industrial toxicologist and acted in a consulting capacity to a number of large organizations, it might be well to invite him to become a Member-at-Large on the committee.

Upon motion by Mr. Stratton, seconded by Dr. Neal, it was unanimously

VOTED

that the American Standards Association be requested to invite Dr. A. G. Cranch, Industrial Toxicologist, Union Carbide & Carbon Corporation, 30 East 42nd Street, New York, to become a Member-at-Large of the Sectional Committee on Allowable Concentrations of Toxic Dusts and Gases - Z37.

The Secretary announced that the Army and Navy Departments had expressed some interest in various standards under consideration by this committee and had requested that representatives be allowed to attend this meeting. This request had been granted.

After brief discussion, and upon motion by Mr. Stratton, seconded by Dr. Neal, it was unanimously

VOTED

that the American Standards Association be requested to invite the U. S. Army and U. S. Navy Departments to appoint representatives to the Sectional Committee on Allowable Concentrations of Toxic Dusts and Gases - Z37.

The Secretary presented a request from the Air Hygiene Foundation to the President of the ASA for official representation on the sectional committee which stated in substance, that although a number of the members of the Foundation were members of the committee, including the Chairman, it was believed desirable that the Foundation be directly represented.

Following discussion, it was agreed that the Secretary should contact the Foundation to obtain additional information on two points: the procedure available to the Foundation for obtaining a consensus of opinion of its members on the proposals of the committee; and a list of the organizations which were represented both in the Foundation and on this sectional committee. When this information had been obtained the request of the Foundation would be given further consideration by the committee.

The Secretary mentioned that at a previous meeting of the committee it had been voted to invite the "Keough Laboratories" to become a cooperating organization. This action had been based on misinformation as it had been intended that Dr. R. A. Kehoe of the Kettering Laboratories be invited to become a Member-at-Large.

Upon motion by Mr. Whiting, seconded by Dr. Neal, it was unanimously

VOTED

that the American Standards Association be requested to invite Dr. R. A. Kehoe of the Kettering Laboratories of Applied Physiology, Medical College, University of Cincinnati, to become a Member-at-Large of the Sectional Committee on Allowable Concentrations of Toxic Dusts and Gases - Z37.

45. Proposed Re-wording of Paragraph 3.1 on Allowable Concentration (Min. 8,18,29). The Secretary reported that Mr. E. C. Barnes of Westinghouse Electric and Manufacturing Company and the Chairman of this committee, Mr. Yant, had both sent in suggestions that the wording of paragraph 3.1 be examined by the committee to see if the intent of the application of the allowable concentration could be clarified. According to the wording now used for this paragraph, the requirement could be interpreted as meaning that at no time a worker could be exposed to a concentration greater than the allowable concentration set up; whereas it might be that a concentration greater than the figure set up in the standard could be found for two or three short periods of five to ten minutes each during the day. If a sample

of air was taken at those specific periods, the plant might be penalized as not complying with the standard.

Dr. Johnston suggested that paragraph 4.1 (d) which required that a number of samples of air should be taken to show whatever differences in concentration exist during the working period, would tend to alleviate this difficulty.

After discussion, it was agreed that this matter should be referred to the ASA Emergency Technical Committee on Quality Control-21 for advice.

46. Adjournment. The meeting adjourned at 5:15 p.m., subject to the call of the Chair.

CYRIL AINSWORTH
Recording Secretary

Reported by
A.Burke
D.Bowlby

AMERICAN STANDARDS ASSOCIATION
29 WEST THIRTY-NINTH STREET, NEW YORK

ASA

Z37/117
April 9, 1943

MINUTES
ASA COMMITTEE ON ALLOWABLE CONCENTRATIONS OF TOXIC DUSTS AND GASES - Z37

November 23, 1942

(Subject to Confirmation)

The meeting was called to order by the Chairman at 10 a.m., in Room 903 of the Engineering Societies Building, 29 West 39th Street, New York.

Present

Cant, W. F., Chmn. (Member-at-Large)
Adams, James F. (API)
Bloomfield, J. J. (APHA)
Crench, A. G. (Member-at-Large)
Cnsminger, G. R. (War Dept.)
Grey, Albert S. (CSPHA of NA)
(Alternate for H. S. Osborn)
Hamilton, Alice (US Dept. of Labor)
Heimann, F. (IAIAPC)
Representing L. Greenburg)
Johnston, John (Member-at-Large)
McCord, Carey P. (AA of IP&S)
Neal, Paul A. (USPHS)
Paine, Walter S. (NSC)
Schrenk, H. H. (US Bur. of Mines)
Snell, Myron A. (AC&SE)
Stratton, Reuel C. (AICE)

Hough, Warren A., Alternate, Association of Casualty & Surety Executives
Irish, B. D., Dow Chemical Company
Low, Frank S., Westvaco Chlorine Products Corporation

Ainsworth, Cyril, Secretary
Lamb, Henry G., ASA staff

Absent

Bowditch, Manfred (IAGLO)
Bolger, John H. (MCA of US)
Brinker, Cecil (Member-at-Large)
Brinker, Philip (Member-at-Large)
Gardner, Leroy U. (Member-at-Large)
Haggard, Howard H. (Member-at-Large)
Hitch, Theodore F. (Member-at-Large)
Henderson, Yandell (Member-at-Large)
Kehoe, Robert A. (Member-at-Large)
Lanza, A. J. (Member-at-Large)
Sebl, F. W. (Member-at-Large)
Selby, D. J. (Member-at-Large)
von Oettingen, W. F. (Member-at-Large)
Vosburgh, [illegible] (Member-at-Large)
Watson, [illegible] (Member-at-Large)
Whiting, S. C. (NAMC)

47. Approval of Minutes. The report of the meeting of December 11, 1942, was approved as circulated.

48. Proposed American Standard Allowable Concentration of Chromic Acid and Chromates, Proposed American Standard Allowable Concentration of Mercury. The secretary reported that the proposed standards on chromic acid and chromates, prepared by the U. S. Public Health Service and sent to voting members on August 14, 1942, had been approved by a wide majority. In both cases, of the total Committee membership of 31, 28 had voted affirmatively, one negatively, and two had not returned ballots as reported in General Letter Z37/103. The two standards were being reviewed from a procedural standpoint by the Executive Committee of the Safety Code Correlating Committee, with a view to recommending them for ASA approval.

(ASA NOTE: Both standards were approved as American Standard, as of January 6, 1943.

49. Proposed American Standard Allowable Concentration of Nitrous Gases (Min. 38, 8). The secretary reported that the recommendation of the Executive Committee the draft standard on nitrous gases had been revised and limited to nitrogen dioxide, with a concentration figure of 50 ppm. The draft had been submitted to vote of the committee in August, 1941.

Attention was drawn to a letter dated September 8, 1941, from J. E. Fouiger, presenting objections to the standard as proposed. Dr. Fouiger had expressed the opinion that the question of compound exposures should be taken into account as well as increased susceptibility due to previous exposures. He had stated that studies made under his direction had indicated that following exposures to much lower concentrations than the proposed 50 ppm there had been produced definite changes in the lungs as well as a tendency to circulatory collapse. Dr. Fouiger's remarks had concluded with the recommendation that the standard be limited to electric and gas welding, and the permissible concentration reduced to 25 ppm.

Following a general circulation of this letter (Z37/100) several members had expressed agreement with one or another of Dr. Fouiger's contentions. There was a sense of opinion as to its acceptability (as described in Z37/103) which indicated need for further consideration of the draft.

Dr. McCord declared that the Committee would be getting into difficulties if it attempted to set up separate standards for single substances on the basis of their presence in individual processes or industries. Other members endorsed this opinion. Dr. McCord also stated that in a review of recent literature he had noticed a disposition to regard nitrogen dioxide as less dangerous than it had been thought, and therefore believed it would be a step in the wrong direction to reduce the concentration unless the Committee had definite evidence so indicating.

A brief discussion established general agreement that the Committee should not at this time enter into the question of mixed gases, or attempt to develop any other than air-gas mixtures.

Dr. Neal believed Dr. Faulkner's opinions should be considered in the light of his supporting data. However, that was not possible at the present time as the details had not been published or made available to the committee.

Upon motion by Dr. Johnston, seconded by Dr. Sonreen, it was unanimously

VOTED

that further consideration of the proposed standard for nitrogen dioxide be deferred until an investigating subcommittee could confer with Dr. Faulkner to ascertain on what exposures, methods of test and on [illegible], etc., his statements were based. The subcommittee would then report its findings and consequent recommendations to the full committee.

The Chairman named Drs. McCord (chairman), Drinker and Schrenk as an investigating subcommittee, with the recommendation that they endeavor to prepare the desired report by January 15.

30. Arsenic, Antimony and Zinc (Min. 33, e). Mr. Ainsworth recalled that at the committee's direction the Chairman had appointed Drs. Neal (chairman), Drinker and McCord as a special subcommittee to investigate the desirability of war standards on zinc, antimony and arsenic. The subcommittee's report (circulated as 337/30) had been unanimous on the undesirability of issuing standards for antimony and zinc. Drs. Neal and McCord had made a majority recommendation for preparation of a war standard on arsenic from which Dr. Drinker had dissented.

Dr. Neal explained that there appeared to be no need for a zinc standard; and that there was insufficient authoritative information on which to set standards for antimony, although the Public Health Service was making a long time study of the latter.

The sectional committee had by letter ballot indicated wide concurrence with both recommendations. This action was ratified in the meeting.

ASA NOTE: In accordance with the Committee's recommendation, the Chairman of the Standards Council subsequently authorized the development of the proposed arsenic standard, under the War Standards Procedure.

Upon motion by Dr. McCord, duly seconded, it was unanimously

VOTED

that the subcommittee to investigate the desirability of standards on zinc, antimony, and arsenic, be discharged with thanks.

A preliminary arsenic draft which had been circulated to the committee, was reported as having met with a good degree of acceptance as detailed in Z57/107. Mr. Ainsworth read excerpts from a number of letters from manufacturers of arsenates, decrying the need for an arsenic standard and stating that the proposed standard would impose upon them an unnecessary hardship. It was commented that these objections seemed in the latter part irrelevant, inasmuch as the standard did not deal with arsenates.

The Chairman remarked, from the economic point of view, that though certain good industries might be successfully controlling a toxic substance, the fact remained that it was toxic and should therefore have some established figure of control.

Mr. Bloomfield noted that the arsenic standard appeared to be needed as evidenced by the inquiries which the State Relations Section, USPHS, received on the subject.

The Secretary said that a number of members had returned qualified affirmative votes approving the draft with the proviso that the concentration be raised to 1.5 ppm from the 1 ppm appearing in the draft. This change had previously been recommended by the Executive Committee.

Upon motion by Dr. Neal, seconded by Dr. Johnston, it was unanimously

VOTED

that the permissible concentration given in the draft standard Allowable Concentration of Arsenic, be set at 1.5 ppm.

It was pointed out that this was proposed only as a duration standard, to be reconsidered at the end of the war.

The committee endorsed suggestions (a) from Dr. Johnston that the parenthetical phrase "(calculated as As)" be inserted after the words "arsenic trioxide" in section 4.1, the concentration statement; and (b) from Dr. Schrenk that the title be changed to "Allowable Concentration of Arsenic and Arsenic Trioxide".

The Editorial Committee was requested to rearrange Section 3.2 (Physical-Chemical Properties) in tabular form. With such changes the standard would be submitted to letter ballot.

(ASA NOTE: This has since been done.)

51. New Skeletal Format for Preliminary Draft Standards. Concern was expressed over the amount of time and work which had gone into the preparation of successive revisions of draft standards, in a number of cases only to be finally discarded. Dr. Johnston reasoned that the basic part of the Z37 standards was Section 3, the concentration statement, plus Section 2, the scope statement. The rest of the standards was of a much less controversial nature. It was his idea, therefore, that in future assignments the authors prepare as a first, preliminary draft no more than a precise statement of scope and a proposed permissible concentration. Once these major points had been agreed on, the other sections could be added to make a complete draft.

This suggestion was enthusiastically received, and after a brief discussion, upon motion by Dr. Johnston, seconded by Mr. Bloomfield, it was unanimously

VOTED

that future first drafts be prepared to consist of only the two basic sections; 2, statement of scope, and 3, proposed allowable concentration; to be supplemented by additional sections as indicated by the degree of acceptance reached on the first two, major points.

52. Status of Subcommittee Assignments. The status of the various sub-projects was reported as covered by Minutes 53 to 62, inclusive.

53. Proposed American War Standard Allowable Concentration of Diethyl Ether (Min. 38, 6) The Secretary reviewed the circumstances which had led to the appointment of a subcommittee of Drs. Flagg (Chairman), Poulger and Hazard, to make recommendations for the disposition of the proposed war standard for diethyl ether. Circulation of a proposed final draft standard prepared by Dr. Hazard had evoked protests from manufacturers of smokeless powder including the Army and Navy, who had objected to the proposed concentration as well as to issuance of the standard on the grounds that it would interfere with the manufacture of smokeless powder.

Dr. Flagg said that the subcommittee had ascertained that it was the opinion of many authorities that existing literature did not give sufficient information as to what constituted a safe maximum permissible concentration of diethyl ether. As Dr. Hazard had once remarked, the

term "maximal permissible concentration" might not only cover concentrations not injurious to health but also such concentrations as would not render persons more prone to accidents. Unfortunately, there was not information with regard to concentrations which would interfere with alertness, muscular coordination, and other factors essential for safety in hazardous operations.

The subcommittee had examined field studies which revealed progress in the control of diethyl ether exposures in smokeless powder manufacture during the past several months. Both governmental and industrial plants were endeavoring to keep exposures as low as possible under war conditions. It was understood that periodic studies of the exposure would continue. Dr. Neal anticipated that the data now being collected would provide a basis for a standard, although it was unlikely that the work of correlation could be done until after the war.

The subcommittee had therefore unanimously recommended that the Z37 committee postpone the establishment of a maximum allowable concentration of diethyl ether.

Upon motion by Dr. Johnston, seconded by Dr. Sonrenz, it was unanimously

VOTED

to accept the report of the special subcommittee: and to recommend to the ASA that the proposed Allowable Concentration of Diethyl Ether be discontinued as a War Standards project; and that its development under the regular procedure be tabled until adequate data on which to base such a standard, might be available.

(ASA NOTE: In accordance with the committee's recommendation, the Chairman of the Standards Council subsequently withdrew the proposed diethyl ether standard from under the War Standards Procedure.)

34. Proposed American War Standard Allowable Concentration of Xylene (Min. 38, e). Dr. Ainsworth reported that comments and criticisms resulting from circulation of the first draft of xylene, had been assembled and relayed to the author, Dr. Greenburg, some months ago. It was remarked that this substance was of considerable interest at present because of its use as a substitute for more critical materials.

The Chairman requested Dr. Heimann to transmit to Dr. Greenburg the committee's consensus that the xylene standard is urgently needed.

35. Proposed American Standard Allowable Concentration of Carbon Tetrachloride (Min. 5). In the absence of Dr. von Oettingen, the subcommittee chairman, Dr. Heal reported that the subcommittee on carbon tetrachloride had completed a third, revised draft which was herewith submitted for the consideration of the sectional committee.

The Chairman commented upon the considerable amount of work that had been done on this subject, and asked Dr. Heal to convey to Dr. von Oettingen, the Committee's thanks.

In reply to an inquiry on this point, Mr. Low stated that the subcommittee had given attention to some recently published work by Dr. Elkins of the Massachusetts Division of Industrial Hygiene which would indicate that the proposed concentration of 100 ppm was too high. However, the subcommittee had considered this data not conclusive because the report had been silent as to the method of sampling and the method of analysis. Mr. Low said that the subcommittee had given the draft very careful and thoughtful attention, and until more definite information was produced was prepared to stand upon the 100 ppm. There was nothing to prevent modification if later evidence so indicated.

Dr. Heimann outlined some departmental work as a result of which he believed the proposed limit should be lower. His observations had indicated that concentrations of between approximately 70 and 80 ppm were capable of producing toxic symptoms.

The subcommittee had tentatively supplemented the standard concentration statement (Section 5) of the draft, providing for a maximum of 100 parts of carbon tetrachloride per 1,000,000 parts of air by volume on the basis of an eight-hour working day, by the following secondary statement: "Higher concentrations of 1,000 parts per 1,000,000 parts of air by volume, corresponding to 6 mg per liter at 25 C and 760 mm Hg may be tolerated for periods of one-half hour." Mr. Low explained it had been the intent thus to convey the information that a man might inhale as much as 1000 parts for a half hour without injurious results.

There was a lively discussion as to how to word this section to bring out the sense of a non-homogeneous atmosphere. The eight-hour average basis had been adopted with a view to covering an excessive exposure for a brief space of time, but the present standard wording seemed inadequate. The Secretary observed that this difficulty had been discussed at the first meeting, when it had been referred to the ASA Committee on Quality Control - Z1, which was now at work on the problem and would report to the Z37 committee.

Dr. Cranch commented that differentiating between eight-hour and limited exposures, called for great care as four or five minutes of an extremely high concentration could be immediately narcotic. Mr. Bloomfield remarked that the wording, as proposed would permit of several half-hour exposures of 1,000 ppm.

The Chairman requested that Messrs. Low, Gray and Irish of the subcommittee on carbon tetrachloride, prepare a recording during the lunch period.

Dr. McCord expressed dissatisfaction with the wording of section 3.3, as proposed, which read: " In sufficiently high concentrations, carbon tetrachloride has narcotic properties similar to chloroform. Continued exposure to lower concentrations which cause no narcosis but which are neither more than 100 parts per million will cause irritation of the mucuous membranes and may lead to injury of liver or kidneys." Dr. McCord stated that though carbon tetrachloride was a respiratory irritant in rabbits, he believed it had no such effects when pure, on human beings. He therefore preferred that this statement be deleted, if the committee so agreed. Dr. Hamilton commented that previously commercial carbon tetrachloride sometimes had free hydrochloric acid to which such irritation might be attributed, to which Dr. McCord replied that that was the origin of the irritation belief.

The Chairman asked the members of the carbon tetrachloride committee to consider this point also, during their luncheon session.

After the noon recess, Mr. Low reported that the carbon tetrachloride group had agreed upon the following recommended wording for the allowable concentration section:

"3.1 The maximum allowable concentration of carbon tetrachloride shall be 100 parts per 1,000,000 parts of air by volume, corresponding to 0.6 mg per liter at 25 C and 760 mm Hg for exposures not exceeding a total of 8 hours daily. Brief exposures to somewhat higher concentrations arising from accidents or emergency, provided such higher concentrations do not raise the daily average above 100 parts per million, are not considered as being injurious."

They also recommended the following in lieu of the disputed sentence regarding toxic properties: "Continued exposure to lower concentrations which cause no narcosis but which are neither more than 100 parts per million may do harm to the liver and kidneys."

Both suggestions were accepted by the committee, and upon motion by Dr. Johnston, seconded by Dr. Schrenk, it was unanimously

VOTED

that with the amendments agreed upon in the meeting the draft standard Allowable Concentration of Carbon Tetrachloride be submitted to letter ballot of the sectional committee.

(ASA NOTE: At the suggestion of several general interest and with the unanimous consent of the drafting subcommittee, the wording of section .. (Fuel-Combustion Properties) has been somewhat extended from the form in which it was originally presented at the meeting. This accounts for the delay in carrying out the recommended action.

56. Proposed American Standard Allowable Concentration of Formaldehyde (Min. 38). Dr. Gray, chairman, reported that the subcommittee on formaldehyde had considered the comments resulting from circulation of the preliminary draft. He reviewed a report on observations of reactions to exposures of various formaldehyde concentrations which had been made by Mr. Barnes of the subcommittee. Mr. Barnes' report had concluded that concentrations between 10 and 20 ppm exerted a definitely irritating property, and recommended that wherever possible the concentration not exceed 10 ppm. The subcommittee therefore tentatively proposed for discussion, a concentration limit of 15 ppm.

Dr. Neal remarked that irritation of the eyes and upper respiratory tract occurred at a point below a toxic concentration.

Mr. Yant opined that when the concentration got to the point of noticeable irritation, workers would complain. He believed that once it was below the range of systemic effects, there was no cause for worry.

In conclusion Dr. Gray said he hoped to submit a new draft within a few weeks.

57. Proposed American Standard Allowable Concentration of Hydrofluoric Acid. The secretary recalled that at its previous meeting the committee had agreed upon the appointment of a subcommittee to assist Mr. Sorditch, who had been asked to prepare a preliminary draft standard.

Drs. Cranch, William ... Cole, and F. ... accepted appointments to the subcommittee, but had not yet ... Mr. Sorditch, their chairman.

58. Proposed American Standard ... Concentration of Lead and Lead Oxides (Min. ...). Dr. Neal gave a resume of the work he and Dr. Fairhall had done since April 11, 1940, in preparing four successive drafts in accordance with the principle decisions of the committee as to what should be covered by the lead standard. He hoped the committee could arrive at a conclusive decision in this meeting.

Dr. Neal drew attention to his chairmanship of a subcommittee to study lead compounds, which had been appointed at the time of the committee's decision that the currently proposed lead ... be confined to metallic lead, lead oxides, ... and ... lead oxides. ... had come

to the conclusion that when one undertook to differentiate between the various compounds in all their varying degrees of toxicity, it became a bit ridiculous from a practical standpoint.

A discussion of the lead compounds with view to grouping those of the same range of toxicity in the one draft, was allowed as follows: The previous decision to drop lead chromate because of insufficient information on which to set a permissible concentration, was confirmed. The sulphide and silicate were to be left out because of thier insolubility and slow action. It was also deemed unnecessary to include the titanate. At Dr. McCord's request, the chromate was eliminated.

Upon motion by Dr. Johnston, seconded by Mr. Snell, it was unanimously

VOTED

> that the proposed lead standard apply to lead and its basic, inorganic compounds, the carbonate, sulphate, oxides, nitrate and chloride.

It was agreed that sections 1.1 and 1.2 (Scope and Purpose) be rewritten to name the various compounds covered by the standard; and that Section 3 (Permissible Concentration) also be revised accordingly.

All apparently favored the proposed concentration figure of 1.5 milligrams per 10 cubic meters of air, for the substances specified.

A recommendation that the title be "Allowable Concentration of Lead and Certain of Its Inorganic Compounds", was adopted.

Mr. Bloomfield raised a question as to the adequacy of the references given for the sampling section., and it was agreed that Dr. Neal should review the reference section and include two modern, readily available references.

The Chairman observed that the usual section on chemical (2.1) and physical-chemical (2.2) properties appeared of no significant value to this particular standard.

Upon motion by Dr. Neal, seconded by Dr. Johnston, it was unanimously

VOTED

> that section 2 of the lead draft be confined to a brief description of the toxic properties, and so entitled.

Inclusion of a reference to the International Critical Tables was recommended.

In accordance with the committee's decision, the Chairman discussed with thanks the subcommittee to consider the preparation of standards for lead compounds.

59. Proposed American Standard Allowable Concentration of Methanol. Dr. Schrenk, chairman, reported that the subcommittee on methanol had reached a state of agreement and that a tentative draft standard would shortly be submitted.

(ASA NOTE: The first, revised methanol draft (Z37/100)) was subsequently circulated to the Committee and the State health agencies for comment and criticism; and the resultant comments transmitted to the subcommittee.)

60. Proposed Report on Silica and Other Dusts (Min. #3, a) The Secretary announced that Dr. Gardner, subcommittee chairman, had written that he had hoped to submit a tentative draft at the meeting, but that circumstances had interfered and it was necessary to defer action until the subcommittee could meet again to reconcile some differences of opinion.

61. Tetrachlor Ethylene and Trichlor Ethylene (Min. #3,). The Secretary announced that Mr. Low had agreed to serve as chairman of this subcommittee, following Mr. Philip Drinker's declension because of the demands of other commitments.

Mr. Low said he doubted there was sufficient information available on which to establish a standard for trichlor ethylene and tetrachlor ethylene. Although the effect of these materials on the whole were more injurious than observed with other hydrocarbons such as carbon tetrachlorides, and a standard was undoubtedly needed, so far as he was aware there was not available information as to what concentrations might cause a feeling which would lead to further exposures and a habit. He personally was inclined to consider 100 ppm as a maximum allowable concentration but did not believe that figure could be set as a standard, and did not approve of setting up a standard without a background of factual information.

Dr. Gray thought it might be quite justifiable to use the generally accepted figure of 100 ppm, which seemed to work out very well.

Mr. Yant said that a great many things must be decided on the basis of the best opinions and reasonable guesses. Various States were setting up numerous standards with nothing like the technical knowledge of this Committee, and if the Committee was to exert a leadership in these matters it might have to go a little bit out on the limb.

There was a discussion of the possibility of issuing documents of a tentative or secondary type, in cases where full standards were not feasible. Mr. Ainsworth suggested that perhaps more the

available information seemed inadequate, the Committee could publish its material as a proposed standard or a report.

Mr. Bloomfield remarked that the proposed arsenic standard seemed to have no more background than was available in this case.

As indicated by the consensus, the Chairman requested Mr. Low to endeavor to develop a standard for tetrachlor ethylene and trichlor ethylene on the basis of the available information and literature, keeping in mind that if the subcommittee could not produce a standard it should try to prepare a report or helpful recommendations.

The Chairman noted that the latter treatment might solve the handling of a number of similar situations. Dr. Gray believed it would serve to stimulate research.

Dr. McCord suggested that the subcommittee look into the medical material based on the use of trichlor ethylene as an anesthetic, particularly a British paper by Jackson.

62. Proposed American Standard Allowable Concentration of Toluene (Min. 37). The Secretary recalled that following Dr. Greenburg's completion of a preliminary draft, he had asked for its return for revision on the basis of some new research which indicated that the tentatively proposed concentration was too restrictive. A subcommittee had been appointed some months ago to assist in preparing the revision under Dr. Greenburg's chairmanship.

Mr. Low remarked that it was important to complete the standard as quickly as possible because toluene was coming into much more general use and would probably supplant benzol in industry to a major degree.

63. Sampling Procedures. In connection with the review of the lead draft, there had been some discussion as to whether one standard method of sampling should be specified in detail, or given by reference. The Z37 standards were not consistent in this regard. Mr. Yant expressed the belief that any good method should be adequate to determine the concentration within reasonable limits. Any given procedure would of course be dependent upon the technical competency of the person doing the sampling.

Mr. Bloomfield drew attention to the activities of the American Public Health Association Subcommittee on Chemical Methods in Air Analysis. The Chairman recommended that Dr. Schrenk, who was a member of the APHA committee, discuss with Dr. Goldman, the chairman, the possibility of directing their work to supply sampling methods for incorporation in the Z37 standards. Dr. Schrenk suggested that as the APHA committee completed its work on subjects for which ASA standards were already in existence, the standards might be revised to include the APHA standard method of analysis. However, Dr. Schrenk questioned prescribing one standard method of analysis when other methods might have equally good results.

It was agreed that the Secretary should communicate with Dr. Goldman, Chairman of the Sub-Committee on Chemical Methods in Air Analysis, with regard to a possible cooperative arrangement between the two committees.

(ASA NOTE: Correspondence between the Secretary and Dr. Goldman has resulted in a tentative agreement for coordinating the programs of the ASA and APHA committees along the lines indicated.)

54. Applicability of Standards to Special Exposures. Dr. Neal raised the question of whether these standards were applicable to women and children: This was an acute problem for the Children's Bureau.

Dr. Hamilton said that because immature individuals breathed deeper and took in larger volumes of air in proportion to body surface and weight, and because their blood circulated more rapidly, it would seem that more poison would be absorbed in an equal time. However, studies made in Boston and New York had thrown a great deal of doubt on the oversusceptibility of women; although there was the question of their periodically increased susceptibility to poisons with hemorrhagic effects. Dr. Neal observed that it might be reasoned conversely that because immature persons had better powers of elimination they might be less susceptible.

Mr. Yant declared he would be more concerned about the problem of overtime, say for men working twelve hours, in which case the actual effective exposures might be doubled by the additional four hours.

After some further discussion, upon motion by Dr. Neal, seconded by Dr. McCord, it was unanimously

VOTED

that the Chairman be authorized to appoint subcommittees: (1) to consider the susceptibility of women and immature persons to toxic substances in the air of work places, and (2) to consider the question of prolonged exposures.

55. Extension of Program. The Chairman asked for any ideas as to new subjects for the Committee's consideration. Among the substances mentioned were ethylene dichloride, propylene dichloride, butadiene, acrylonitrile, styrene, propane, isoprene, and trichloronitrile. Mr. Low stressed the need for a standard on hexochlorethane.

Mr. Bloomfield wondered whether consideration had ever been given to developing standards for radio-active substances, such as luminous paints which were coming into the question more and more. It was remarked that this would be a problem of noxious radiation, not noxious fumes. The Chairman declared that if the question were coming

to the form and if there was suitable information available, the Committee should be alert to recognize [illegible] the need for standards. He believed the scope of the project would cover this phase. Dr. Keel said that it would be necessary to wait a while to get clinical information from industry, but from the way it was piling up that should not be long.

Dr. Irish recommended preparation of a standard for styrene, as a guide to industry. He explained that his organization had had several years of animal experimentation but there was no clinical experience. All agreed that the synthetic rubber had opened up a new and comparatively unexplored field.

Upon motion by Dr. Johnston, seconded by Dr. Grey, it was unanimously

VOTED

that the establishment of allowable concentration standards for styrene monomer and acrylonitrile be undertaken.

At the Chairman's request, Dr. Irish agreed to prepare a preliminary draft on styrene; and Dr. Keel, a draft on acrylonitrile.

By unanimous agreement, the Chairman was authorized to appoint a subcommittee to consider new substances for standardization.

66. Changes in Format of Standards (Z37/90). The Secretary announced that by correspondence the Committee had approved the following revised wording to be used for section 1.2 of the standards:

"The purpose of the standard is to safeguard the health of all workers by prescribing the permissible concentration of ---- in the atmosphere of work places."

Dr. Schrenk proffered for consideration a slightly different wording which he thought might be still more effective. This met with general favor, and upon motion by Dr. Bloomfield, duly seconded, it was unanimously

VOTED

that section 1.2, the purpose statement in the Z37 standards, be worded as follows:

"The purpose of the standard is to prescribe the permissible concentration of ---------- in the atmosphere of work places for guidance in establishing control procedures for the protection of the health of workers."

The Secretary reported that by correspondence (Z37/101) the Committee had accepted Dr. Johnston's suggestion for using sub-heads to set off the separate sections of Section 2, Properties: i.e.,

2.1 - General Properties; 2.2 - Physical-Chemical Properties; 2.3 - Toxic Properties.

68. Applications for membership (Min. 44). It was reported that the Air Hygiene Foundation had withdrawn its previous request for membership in the Committee, the Trustees having concluded that the AHF was already closely allied with the activities of the Committee through the number of committee members who were directly connected with the work of the Foundation.

The Secretary announced that under date of September 17 the American Industrial Hygiene Association had officially asked for membership on the Committee. The Association had established organizational procedures and personnel for arriving at association opinions.

Upon motion by Dr. Johnston, seconded by Major Stratton, it was unanimously

VOTED

to recommend to the Safety Code Correlating Committee that the American Industrial Hygiene Association be accorded membership on the Committee for Allowable Concentrations of Toxic Dusts and Gases - Z37, with the understanding that the Association would designate as its representative one of the Members-at-Large now serving on the Committee.

69. Adjournment. The meeting adjourned at 4:45 p.m., subject to the call of the Chair.

CYRIL AINSWORTH
Secretary, Z37

Reported by
A. Burke

AMERICAN STANDARDS ASSOCIATION
29 WEST THIRTY-NINTH STREET NEW YORK 18 N. Y.

ASA

237/158
January 6, 1944

M I N U T E S

ASA COMMITTEE ON ALLOWABLE CONCENTRATIONS OF TOXIC DUSTS AND GASES - Z37

November 23, 1943

(Subject to Confirmation)

The meeting was called to order by the Chairman at 9:45 a.m., in Room 903 of the Engineering Societies Building, 29 West 39th Street, New York.

Present

Cant, W. P., Chmn. (Member-at-Large)
Adams, James M. (API)
Bloomfield, J. J. (APHA)
Branch, A. G. (Member-at-Large)
Gardner, Leroy U. (Member-at-Large)
Gray, Albert S. (CSPHE of NA)
(Alternate for H. E. Osborn)
Greenburg, Leonard (DAIASC)
Hamilton, Alice (US Dept. of Labor)
Johnston, John (Member-at-Large)
Mc Cord, Carey, P. (AA or IP & S)
Neal, Paul A. (USPHS)
Paine, Walter S. (NSC)
Schrenk, H.H. (US Bur. of Mines)
Selby, D. C. (Member-at-Large)
Snell, Myron A. (AC&SE)
Stratton, Reuel C. (US War Dept.)
(Rep. Lt.Col. G.R.Ensminger)
von Oettingen, W.F.(Member-at-Large)

Balto, T.R., Heyden Chemical Corp. New York, N.Y. and Garfield, N.J.
Commander Burton, Otto L., Navy Department
Chapman, George H., Alternate, National Association of Mutual Casualty Companies
Erskine, Lillian, Division of Labor Standards, U.S. Dept. of Labor(alternate)
Frary, F. C., American Aluminum Co.
Hough, Warren, A., Alternate, Association of Casualty & Surety Executives
Irish, D. D., Dow Chemical Company
Low, Frank S., Westvaco Chlorine Products Corporation

Ainsworth, Cyril, Secretary
Lamb, Henry G., ASA Staff
Hayes, Daniel, ASA Staff

Absent

Bowditch, Manfred	(IAGLO)	Henderson, Yandell	(Member-at-Large)
Foulger, John H.	(MCA of US)	Kehoe, R. A.	(Member-at-Large)
Drinker, Cecil	(Member-at-Large)	Lanza, A. J.	(Member-at-Large)
Drinker, Philip	(Member-at-Large)	Sehl, F. W.	(Member-at-Large)
Harrard, Howard W.	(Member-at-Large)	Vosburgh, B.L.	(Member-at-Large)
Hatch, Theodore, F.	(Member-at-Large)	Watson, C. H.	(Member-at-Large)

84. Approval of Minutes. The minutes of the meeting on April 27, 1943, were approved as circulated.

85. The Secretary reported that the committee had to date developed eight American Standards and four American War Standards. Since the last meeting of the sectional committee, draft standards for the following substances had been approved by the ASA: Metallic Arsenic and Arsenic Trioxide, Xylene, Lead and Certain of Its Inorganic Compounds, and Toluene.

The Secretary advised that the draft on Oxides of Nitrogen was before the Executive Committee of the SCCC for recommendation to the Standards Council of the ASA, and that the draft on Methanol was before the sectional committee for letter ballot. He also reported on the status of standards covered by minutes 86 and 87.

86. Styrene Monomer. The Chairman recalled that the draft which had been prepared by Dr. D. D. Irish of the Dow Chemical Company was then before the sectional committee for its consideration.

Dr. Irish stated that, in the animal experimentation, the animals were kept in a concentration of 600 ppm for many months. It was indicated, however, that such a concentration was too irritating and would not provide proper working conditions. The concentration, therefore, had been set at 400 ppm.

Upon motion by Mr. J. J. Bloomfield and seconded by Dr. Schrenk, it was unanimously

VOTED

that the draft be submitted to letter ballot of the sectional committee with a recommendation for favorable action.

87. Carbon Tetrachloride. The Secretary reported that the draft standard which had been submitted to letter ballot of the sectional committee under date of October 4, 1943, had received negative votes from Mr. Bowditch, Mr. Bloomfield, Mr. Foulger and Dr. Philip Drinker. The negative vote of Mr. Foulger had not concerned

the allowable concentration but concerned the inadequate wording of Paragraph 2.3. Dr. Hamilton had cast an affirmative vote, but in so doing, had expressed the thought that in her opinion the allowable concentration was still too high. She had voted in the affirmative in order to avoid delay in the promulgation of the standard.

The Secretary also had had correspondence with Mr. Bowditch in which the Secretary urged that the Bureau of Industrial Hygiene delay issuing its recommendations until the ASA committee could consider the standard further in the hope that a meeting of minds could be obtained. The Secretary then read a communication from Mr. Bowditch outlining the position of the Bureau of Industrial Hygiene of Massachusetts.

In opening the general discussion, the Chairman stated that he did not want the committee to rush through a standard on carbon tetrachloride believing it necessary that the committee consider all of the technical information available.

Dr. Greenburg also advised that he did not consider the concentration of 100 ppm, as specified in the draft submitted to the committee, as satisfactory on the basis of the information he had available. He had voted in the negative because of the facts obtained in the investigation of two fatalities occurring in New York State. He was planning to have a thorough review of all of the facts in connection with these cases made by the chemists of his division and would be pleased to make this information available to the committee.

Mr. Low expressed the opinion that the evidence in Dr. Elkins report on which the decision of Massachusetts is primarily based did not justify the reduction of the concentration below 100 ppm. He advised that the best reliable information indicated that exposure to a concentration of 100 ppm would not cause any systemic poisoning, and especially emphasized that the manufacturers would back any standard that was reasonable. If necessary they would agree to concentrations to 50 or 75 ppm. Mr. Low was of the opinion, however, that if the concentration appeared to industry to be an unreasonable figure, the standard would defeat its own purpose.

Dr. Irish indicated that operations carried on under the concentration of 100 ppm had not produced any subjective symptoms and that the concentration would, therefore, appear to be satisfactory.

Dr. von Oettingen stated that 100 ppm had been always safe and that literature as well as experience had proven that point. He also claimed that the cases which had occurred had not shown symptoms of poisoning as no evidence of poison could be found. Dr. von Oettingen was of the opinion that the question before the committee was one of interpreting the intent of the maximum permissible concentration. Is the maximum permissible concentration set at a point which will prevent

systemic poisoning or is it also intended to prevent discomfort? Dr. von Oettingen believed that concentrations up to 100 ppm can cause toxic effects and he agreed that they may also cause subjective unpleasant symptoms. The committee, therefore, must make the decision as to what is its intent in setting the allowable concentration.

In the general discussion which followed, it was agreed that concentrations less than 100 ppm may result in effects such as nausea and vomiting. Dr. Greenburg suggested that it might be satisfactory to maintain the concentration at 100 ppm but that a statement be added to Paragraph 3.1 which would call attention to the fact that such concentration and even lower concentrations may cause symptoms such as nausea and vomiting in sensitive persons. Such concentrations, however, are not necessarily indicative of systemic poisoning. Mr. Paine expressed the wish that the committee revise the standard to incorporate Dr. Greenburg's suggestion. In so doing, the committee would be developing a standard based on experience.

Mr. Whiting stated that he understood that deaths had occurred due to exposure to concentrations less than 100 ppm and asked whether or not members of the committee had information to show that the Bureau of Industrial Hygiene of Massachusetts had based its decision on such alleged cases. No member of the committee, however, knew of such cases.

After further general discussion, the Chairman referred the draft standard back to the subcommittee in charge of this subject with the recommendation that it prepare a revision based on the suggestion of Dr. Greenburg, and that the revised draft be then submitted to the Bureau of Industrial Hygiene of Massachusetts for its review before any further action is taken by the ASA committee.

88. Formaldehyde. Dr. A. S. Gray, Chairman of the subcommittee reported that he was unable to prepare a draft standard inasmuch as Dr. Greenburg had not submitted his material to him. Dr. Gray, however, thought that the concentration limit ought to be kept at a figure to prevent the workers from becoming irritated.

Dr. Leonard Greenburg advised that he had received complaints from workers when the concentrations were set higher than 5 ppm. For this reason, he had voted "NO" on the letter ballot. It was his contention that workers will not work in a room at a concentration over 5 ppm and that a great deal of conjunctivitis is the result. A limit of 10 ppm was definitely objected to by Dr. Greenburg.

In Dr. Gardner's opinion a concentration over 5 ppm resulted in a high degree of susceptibility and dermatitis.

Dr. McCord concurred with Dr. Gardner in that it resulted in a marked degree of dermatitis with severe pain.

Further discussion ensued regarding the concentration as regards the discomfort or poisoning experienced by the workers. Dr. Schrenk, however, suggested that the subcommittee establish a limit based on the poisoning effect which could be referenced to a footnote calling attention to the irritating action of exposure to concentration higher than the limit specified.

At this point, Dr. Greenburg agreed to send Dr. Gray a summary of all the material he had on Formaldehyde.

89. Trichloroethylene. Mr. F. Low, chairman of the subcommittee, on Trichloroethylene reported that no draft standard was prepared inasmuch as there is very little information on this substance regarding the allowable concentration. Also, it could not be determined whether trichlorethylene has a similar effect as carbon tetrachloride in cardiac disturbances. Mr. Low indicated that he disliked very much using a concentration of 200 ppm now generally accepted, and then later on discover that such a concentration is hazardous. He was certain that an extensive study could be completed before the end of this year. He could not promise, however, as to how soon the draft would be available.

It was Dr. Selby's belief that inasmuch as everybody accepts 200 ppm, the committee ought to accept a tentative concentration and should it prove to be incorrect, the committee can later state so.

At this point, Dr. von Oettingen frankly stated that he did not know what the correct concentration should be on trichloroethylene, and strongly felt that it was very important that the concentration limit be set correctly.

Mr. Bloomfield remarked that most of the states were operating on a 200 ppm concentration based on sound engineering practices and Dr. Gray concurred with Mr. Bloomfield adding that no serious disturbances had been experienced although concentrations had been sometimes set at even higher figures than 200 ppm. On the other hand, Dr. Greenburg definitely objected to a concentration of 200 ppm due to the two fatalities which had occurred in this neighborhood. He explained that, in his opinion, a limit should not be set until a more thorough investigation is made.

Following further discussion, it was agreed that the subcommittee prepare a draft standard and submit it for consideration to the ASA committee. Dr. Greenburg then offered to forward

Mr. Low a paper on trichloroethylene and safe concentrations published by the New York State Department of Labor a year ago.

90. Acrylonitrile. Dr. Paul A. Neal, Chairman of the subcommittee on Acrylonitrile advised that a great deal of time had been spent on this substance and that his committee had been unsuccessful in arriving at a decision inasmuch as there was no analytical method that could be used. He suggested that this project be delayed until such time as a method of analysis could be determined. He was willing, however, to prepare a standard upon further instructions from the committee.

At the suggestion of Dr. Bohrenk and upon motion by Dr. Greenburg seconded by Mr. Paine, it was unanimously

VOTED

that the subcommittee be requested to prepare a standard based not on air, but on urine analysis.

91. Silica. Dr. Gardner, Chairman of the subcommittee on Silica, reported that his committee believed it was impractical to set a standard for permissible concentration of silica that would be applicable to all industries because silica hazards cannot be measured by concentrations alone. Concentrations can be used, however, as benchmarks or guides. He objected to the stating that no danger of silicosis can be incurred up to a certain limit.

It was suggested by Dr. Gardner that, inasmuch as 5 million parts per cubic foot was established at the National Silicosis Conference, we can do likewise. Apparently this limit was found to be satisfactory. It may prove, however, to be satisfactory in some industries and dissatisfactory in others. Dr. Gardner also advised that we could perhaps have a standard on different forms of free silica.

Mr. Bloomfield concurred with Dr. Gardner in that the committee should write a standard containing concentrations for certain dusts found in various industries, such concentrations to be based on sound field laboratory work.

It was Dr. Greenburg's belief that a sliding scale of concentrations for two, three or four industrial groups would be practical in view of the data which are at the disposal of the committee. He recommended that Dr. Gardner's suggestion be followed and that such concentrations be referred to as benchmarks for operating purposes.

Mr. Paine also agreed and urged that the subcommittee establish some threshold limits along the lines suggested and present them to the full committee as soon as possible.

Finally, upon motion by Dr. Johnston, seconded by Mr. Whiting, it was unanimously

VOTED

that the subcommittee be requested to proceed with the development of a standard which could be presented to the committee for consideration at the earliest possible date.

92. Committee on New Substances. Dr. McCord, Chairman of the subcommittee on New Substances advised that a report had been sent to the committee requesting that subcommittee personnel be appointed for the consideration of standards on fluorine, fluorides and methyl chloride.

In discussing the necessity of a standard for methyl chloride, Mr. Paine asked Dr. Neal whether or not it was important that such a standard be developed from the point of view of air conditioning and the preservation of food.

Dr. Neal informed the committee that the National Research Council had several meetings on this problem of providing a substitute for freon used in air conditioning and refrigeration. He stated that many letters had been received by the U.S.P.H.S requesting information as to whether or not methyl chloride was suitable as a substitute for freon. Insufficient information is available to make it possible to state that a certain concentration of methyl chloride could be safe. It was believed, however, that 500 ppm, which some have suggested, was too high for methyl chloride. Dr. Neal further stated that it was difficult to determine the maximum permissible concentration because little research had been conducted.

Upon motion by Dr. Neal, seconded by Mr. Paine, it was

VOTED

that a subcommittee be appointed to prepare material for a standard on methyl chloride.

Dr. Frary suggested that while the subcommittee on hydrofluoric acid which had been appointed many months ago had not proceeded with its assignment, nevertheless it appeared to be a logical committee to consider fluorine and flourides.

In accordance with the suggestion of the Secretary and upon motion by Dr. Schrenk, seconded by Mr. Selby, it was unanimously

VOTED

that the committee on hydrofluoric acid be discharged and a new committee formed to consider fluorine, fluorides and hydrofluoric acid.

Note:)
Subsequent to the meeting the following committee was appointed:

Dr. Paul A. Neal, Chairman
Dr. Carl Voegtlin
Dr. F. C. Frary
Dr. H. A. Mehoe
Mr. M. Bowditch
Dr. A. G. Cranch

The Secretary informed the committee that the ASA office was continuing to receive requests for information on Tetryl and TNT.

Colonel Stratton suggested that inasmuch as there was a Canadian Standard on Tetryl and TNT, it might be advisable to refer all future inquiries of this standard, and if additional information was desired, to the Safety and Security Branch, Ordnance Department, Chicago, Illinois.

The desirability of establishing a standard on radium was questioned by Dr. Greenburg. He understood that 1300 workers were engaged in the radium industry in the State of New York at the present time. He mentioned that the New York State Department of Labor was developing a code for radium content of expiring breath.

Dr. Gray mentioned that in Connecticut there was very little radium painting, but nevertheless there had been several deaths.

The difficulty of drawing up a standard for radium was discussed by Lt. Commander Burton. Because no other standards

were available, the Navy Department had to write their own specifications. He believed it was desirable that a standard should come from a body such as the American Standards Association.

Upon motion by Dr. Neal, seconded by Mr. Paine, it was unanimously

VOTED

that a committee be appointed by the Chairman to consider standards for Radium Dust, Radon Gas in Expired Air and Workroom Air and Gamma ray exposure.

Adjournment. The meeting adjourned at 2:00 p.m.

CYRIL AINSWORTH
Secretary, Z37

Reported by
J. Cappelletti

cc: Alternates
Organizations
Specials

ASA
AMERICAN STANDARDS ASSOCIATION
70 East Forty-fifth Street, New York 17, N. Y.

337/206

NOT FOR PUBLICATION

MINUTES

ASA COMMITTEE ON ALLOWABLE CONCENTRATIONS OF TOXIC DUSTS AND GASES, Z37

November 20, 1945

(Subject to Confirmation)

The meeting was called to order by the Chairman at 10.15 a.m., in Room 128, Hotel Biltmore, 43rd Street and Madison Avenue, New York, N.Y.

Present

Yant, W.P., Chairman	(NSC)
Bloomfield, J.J.	(APHS HS)
Bowditch, Manfred	(IAGLO)
Branch, A.G.	(Member-at-Large)
Erskine, L. (Alternate for A. Hamilton)	(U.S. D. of L.)
Gardner, L.U.	(Member-at-Large)
Greenburg, L.	(IAIABC & NCGIH)
Gurney, S.W.	(NAMCC)
Kehoe, R.A.	(AIHA)
Lanza, A.J.	(Member-at-Large)
McCord, C.P.	(AA of IP & S)
Neal, P.A.	(FSA PHS)
Schrenk, H.H.	(USDI BM)
Snell, M.A.	(NCB)
Stratton, R.C.	(AI of CE)
Woody, McI.	(API)

Bonsib, R.S., Alternate, (API)
Chapman, G.H., Alternate, (NAMCC)
Goldman, F.H., U.S. Public Health Service
Hough, W.A., Alternate, (NCB)
Low, F.S., Westvaco Chlorine Products Corp
Webster, S.H., U.S. Public Health Service

Ainsworth, C., ASA Staff
Lamb, H.G., ASA Staff
Hayes, D.F., ASA Staff

Absent

Drinker, C.K.	(Member-at-Large)
Drinker, P.	(Member-at-Large)
Foulger, J.H.	(MCA of U.S.)
Haggard, H.W.	(Member-at-Large)

Hatch, F.F. (Member-at-Large)
McConnell, W.J. (U.S. War Dept)
Osborn, S.H. (CSPH of NA)
Sehl, F.W. (Member-at-Large)
Selby, C.D. (Member-at-Large)
von Oettingen, W.F. (Member-at-Large)
Fosburgh, B.L. (Member-at-Large)
Watson, C.H. (Member-at-Large)

The Chairman introduced the following new members of the committee: Dr. McIver Moody and his alternate, Mr. A.B. Bonsib, representing the American Petroleum Institute, and Mr. B.W. Gurney, representing the National Association of Mutual Casualty Companies.

104. Approval of Minutes. The minutes of the meeting on September 30, 1944 were approved as circulated.

105. Resignation of John Johnston. The Chairman announced that under date of October 15, 1945 Dr. Johnston had presented his resignation as a Member-at-Large on this committee. He had stated that it had been necessary for him to restrict his activities due to ill health. It was recalled that Dr. Johnston had served very ably as Chairman of the Editorial Committee. His work had been of great importance, particularly in the editorial accuracy of the standards approved by this committee but because of the reasons given it was considered only just that the resignation should be accepted. It was agreed that the Secretary should write to Dr. Johnston, thanking him for the able assistance which he had given the Z37 committee.

106. War Standards. Mr. Ainsworth reported that at the last meeting of Standards Council it had been suggested that all committees which supervise work in technical fields review the war projects which had been adopted to determine which of those standards should be retained, which should be changed to regular American Standards, which should be cancelled altogether, and which should be studied further to determine what action should be taken. This committee had developed 5 American War Standards, namely Allowable Concentrations for Cadmium, Manganese, Metallic Arsenic and Arsenic Trioxide, Xylene, and Styrene Monomer and it should now determine what action it would take with regard to these 5 standards. Dr. Kant stated that he believed the War Standards should be reconsidered; that there unquestionably was industrial hazard from exposure to each of the substances for which War Standards had been approved; that the substances used during the war would continue in use during the peacetime with the same hazards applicable.

Dr. Kehoe stated that the substances prepared under the War Standard procedure had been handled in this manner because it had been felt that the information available on these substances was not very complete but in a measure tentative, but that industry wanted guidance and it was desirable to give it the best knowledge on the subject even if it was not the final word. Since the situation had not changed with the cessation of war, and industry would continue to use substances for which they needed guidance it was

desirable to continue standards for them, even if these standards were called tentative, just as long as industry was aware that the standards were not the final word, but based on the best knowledge at the moment. Mr Bowditch said he was in complete agreement with Dr. Kehoe and that he had also spoken to Dr Drinker on the telephone and he, too, felt that the War Standards should be continued as regular American Standards subject to whatever corrections the committee felt necessary, and it was suggested that each War Standard be referred back to the subcommittee which had developed it.

Upon motion by Mr. Stratton, duly seconded, it was unanimously

VOTED

that the 5 American War Standards prepared by the Z37 committee be referred back to the subcommittee which had developed them for review and recommendation to the entire Z37 committee concerning approval as American Standards.

The Chairman announced that it was entirely within the province of each subcommittee chairman to invite additional members to serve on his subcommittee if he so desired.

107. Reconsideration of Scope (Mins 1, 100). Mr. Ainsworth recalled that at the last meeting the question had been raised as to whether toxic limits for the prevention of dermatitis were included within the scope of the Z37 Committee. The scope of this committee was as follows:

"To determine and promulgate the allowable concentration limits of harmful gases, vapors, fumes, dusts, and mists; and other subjects related to the allowable concentration limits of such substances in the atmosphere of working places from the viewpoint of occupational disease prevention."

During the past two or three years it had been realized that this scope only touched on one phase of the question of toxic substances. There had been several occasions when the subject of dermatitis previously had been raised, furthermore there had been a great demand for instructions on the safe handling of toxic substances rather than just a statement of the maximum allowable concentration. The question had been raised as to just what parts of this problem were covered under the present scope and as to whether the committee should recommend any changes in the scope in order that other parts of this problem might be covered by the Z37 Committee or whether this committee would have any particular viewpoint if the ASA should be requested to form additional sectional committees to handle other phases of the problem of toxic substances.

The Chairman recalled that concerning the part of the scope, "and other subjects related to the allowable concentration

limits of such substances in the atmosphere of working places," the question had been raised before as to whether physiological and biological standards as a measure of air contamination could be included in Z37 standards. He mentioned that at the last meeting Dr. McCord had discussed the control of dermatitis and the possibility of drawing up a set of rules or criteria for the determination of the existence of industrial dermatitis.

Dr. Kehoe thought that the use of biological or physiological standards as a practical expression of the facts of atmospheric condition on the personnel of the plant was very valuable. He considered that a standard based on that type of a test was included within the present scope. There had been no mention in the scope as to whether the atmospheric contaminants were absorbed through the lungs or injested as a result of swallowing but he believed that all of the standards which had been developed by this Committee gave proper consideration to both of these effects. He believed that perhaps the most important point was in connection with the possible absorption of toxic substances through the skin where the control of the substances is not necessarily based on the control of air contamination. He seriously questioned that this committee should venture into the field of dermatitis.

Dr. Branch commented that the object of this committee had been to fill a gap in the source of safety information. He agreed that the scope should be interpreted to include either tests of the atmosphere or physiological or biological tests to measure atmospheric contamination, but he did not believe that the scope included either dermatitis or the general type of skin absorption of chemicals.

The Chairman pointed out that Mr. Ainsworth had no desire to enlarge the scope of this committee but had merely raised the question because of the problems which are frequently brought to the ASA. He recalled that the ASA had been requested to develop a code on the industrial use of x-rays and Mr. Ainsworth had conferred with him to be sure that there was agreement that a separate committee should be appointed to handle this subject rather than refer it to the Z37 Committee.

After further discussion by Messrs. Bowditch, Neal and Stratton, upon motion by Dr. Branch, seconded by Dr. Kehoe, it was unanimously

VOTED

> that the committee continue under the present scope with the interpretation that this scope included permission to use physiological or biological tests when these were found to be practical for the determination of atmospheric conditions.

108. General Policy on Developing Standards and Reports. The Chairman remarked that this committee had on a number of

occasions initiated work on a particular substance. Later on the recommendation of subcommittees work had been discontinued because of limited data available The question of the amount of data or evidence necessary for arriving at a standard had come up frequently in the discussion on many individual standards which had been considered by this committee. The question was primarily one of whether or not this committee should wait until complete data was available before establishing a standard or whether with incomplete evidence a proper safety factor should be applied in order that a standard could be approved and put into use at the earliest convenient time.

Mr. Low thought that standards should certainly be something better than just a wild guess Then a subcommittee reported that insufficient data was available on which to base a standard there should be facilities for referring such problems to a research organization to develop additional facts. In further development of this idea it appeared that probably many research institutions could be brought into this work.

Mr. Ainsworth remarked that he was concerned about this problem from a slightly different angle. Although the American Standards Association was in no way trying to build up work for itself or to develop a vast array of standards, he recalled that at the start of the work of this association there had been a large body of state regulations concerning working conditions and many of the problems arising out of accident prevention work. These regulations varied widely from state to state and practically no two of them were alike. Because of this confusion the American Standards Association had been requested to develop many safety standards. Through reference to the discussion at this meeting he called attention to the fact that many of the states were now establishing maximum allowable concentrations for a long list of substances. Whereas there were 16 approved maximum allowable concentrations which had been developed by this committee, several states had lists of over 100 chemical substances. Some of these state regulations had been based upon sound research and other concentrations approved by the states had of necessity been based upon sheer estimates without any particular research or facts upon which to base their figure. He had in the past been faced with the problem where a state would write to the ASA and inquire if a standard were available on a certain substance. He had written back to the state advising that a subcommittee was working on that substance and hoped to have a standard available. Although he had not been able to predict how soon this work would be completed he had urged the state to delay promulgation of their order until the work of the subcommittee had been completed. Then the subcommittee had reported that there was insufficient data on which to base a standard and Mr Ainsworth had been forced to write to the state to advise them that work on this substance had been discontinued and it would therefore be necessary for them to go ahead and promulgate their own order on this substance without any assistance from this committee He had looked upon American Standards simply as a tool for use at the moment. It was the general understanding that these standards

could be changed at any time in the light of new information whenever it became advisable. He realized that many state health departments looked to the Z37 Committee as being authoritative and he realized that standards should be based upon facts whenever available. He suggested that the committee might wish to consider the possibility of developing tentative reports on subjects where they did not feel there was sufficient information available on which to base American Standards. He was quite sure that such reports could be published in order to provide guidance as to the best thinking of the moment which would be of real help to the state regulatory bodies rather than to discontinue the work on a substance because of lack of information.

Dr. Kehoe believed that this suggestion contained a great deal of merit He suggested that where a new material had been produced and studies had been made on it through animal experimentation he did not think that any reasonable person would hesitate to accept the results of animal experimentation as giving a reasonable basis for some kind of conclusion with reference to the effects of this substance on human beings. Where specific information was not available he thought that a report could be issued which would serve as a guide giving an upper limit beyond which it would be considered that the substance would probably be harmful, and a lower limit where best information at the moment would be quite certain that no harmful effects would result.

Mr. Stratton agreed wholeheartedly with the suggestions of Mr. Ainsworth and Dr. Kehoe He reported that the various allowable limits for certain substances which were being promulgated by the various states presented a problem to insurance companies. He suggested that where sufficient information was not available it might be helpful to develop tentative standards as a service to industry.

After further discussion by Messrs. Bloomfield, Bowditch, Heal and Schrenk, upon motion by Mr. Schrenk, seconded by Mr. Bowditch, it was

VOTED

that on any substance which was considered by this committee the first aim should be to establish a regular American Standard, if it were found that the data available was not sufficient to warrant such a standard that consideration be given to establishing a tentative standard, if the committee found that the data available was not suitable to put into a tentative standard the committee should at least prepare a report which could be published by the American Standards Association in order to present the information available at the time concerning the given substance.

109. Revisions of Approved Standards Mr Ainsworth recalled that some two or three years ago the committee had

discussed the relationship of work of the Z37 Committee with that of the Subcommittee on Chemical Method in Air Analysis of the American Public Health Association and they had agreed that the work of the two committees should be coordinated. Nevertheless in standards prepared by this committee since that time standard methods of analysis as prepared by the APHA had not always been included. Another point to be considered was that the ASA had become aware of the fact that there were certain American Standards which dated back to 1924 with no indication that they had been reviewed since then, so that people using the standards were in doubt as to whether these standards were the latest information on the subject. As a result the ASA had adopted a policy recently of reviewing standards at least once every three years and if in the opinion of the committee in charge of such standards they were still effective and up to date, the ASA merely stamped the date of such reaffirmation on the cover of the standard to indicate that it had been given reconsideration. Since some of the Z37 standards were now more than three years old it might be desirable to consider including the American Public Health standard methods of analysis for those substances for which methods were available.

Dr. Goldman stated that he believed that the Z37 standards should contain more detailed information about analytical methods and sampling procedures, more specific information as to type of collecting devices and description of instruments. The Chairman explained that this has been brought before the committee in the past and it had been agreed that to go into such detail would become very involved and that for all practical purposes if the person who did the sampling was a qualified expert, detailed information would be unnecessary. He recalled that the standards specified that samples and tests shall be made by qualified experts. In addition the basic purpose of the standards had been to establish allowable limits.

The committee agreed that when a subcommittee included methods of test in a standard such inclusion indicated approval of the methods. The committee further discussed whether the methods of analysis prepared by the APHA should be incorporated in the standards in some special way or whether they should simply be added to the list of standard methods of analysis. It was the general consensus that the latter arrangement should apply.

Upon motion by Mr. Bloomfield, duly seconded, it was

VOTED

that on all standards subject to revision and all standards already approved by the ASA, for which standard methods of test have been developed by the American Public Health Association, these methods of test be referred to the proper subcommittees for inclusion in the revised standards.

110. Arsenic (Min 77). The Chairman recalled that a letter had been received from Phillip Drinker, asking for a reconsideration and change in the arsenic standard. This letter had been circulated to the members of the Committee as Z37/193. Since this was a War Standard and since it had been voted to refer all War Standards back to the subcommittees for reconsideration, it was felt that this procedure would automatically take care of Dr. Drinker's request that the present concentration be reconsidered, in that the subcommittee would study all additional data on the subject.

111. Carbon Tetrachloride (Min 102). The Chairman recalled that carbon tetrachloride had received a great deal of consideration from this committee. The subcommittee had prepared a total of 6 drafts. At the last meeting it had been voted that the draft be referred back to the subcommittee for further consideration.

Mr. Ainsworth reported that the subcommittee had recommended that the 6th draft be sent out to letter ballot of the full committee. This ballot had been circulated on April 5, 1945. The ballot had been closed on June 7, 1945 with the following results:

Affirmative votes	- 21
Negative votes	- 8
Not voting	- 1

Because of the negative votes it appeared that a concensus had not been established in favor of this draft and the standard had therefore been held in abeyance for further action of the Z37 Committee. In its last report the subcommittee had asked that it be discharged with the submission of that report. Since the close of the letter ballot word had been received that Dr. McCord and some of his associates had been making a special study of this subject. At Mr. Ainsworth's suggestion Dr. McCord had prepared a synopsis of the report of their investigation, which had been circulated to all members of the committee as Z37/200. It was recalled that the differences of opinion within the committee were centered around the question of whether the concentration should remain at 100 parts per million, which seemed to be the limit where serious systemic effects took place or whether the limit should be placed at a lower concentration because of reported effects upon the workers of concentrations below 100 parts per million which caused absence from work and interruption to general production. Consideration had been given to the possibility of setting a dual standard but this idea had been rejected by the committee. The Chairman asked Dr. McCord for a report on the findings of his investigation.

Dr. McCord reported that with his associates, Dr. Sterner

Dr. Kline and Pearl E. Williams, research had been carried on for about 15 months with reference to carbon tetrachloride. His group had received a great deal of help from the National Research Council that had been working on fractions of albumen globulin. They had also received a great deal of help from Dr. Maclagan, since he had been the originator of the tests which had been used. They also had received help from the Stevens Hospital in Detroit. His work had been divided roughly into three parts, first, work on specimens from 794 human beings. This work had been largely for the purpose of studying the value of the tests which were being used. Secondly, they had done considerable work with fractions of gamma globulin and other substances which had been provided from the Harvard group of the National Research Council, and thirdly, they had done a fair amount of work with animals. This latter work had been with reference to concentrations of carbon tetrachloride.

Dr. McCord recalled that Dr. Maclagan in an obscure hospital in England had reported on a method known as thymol turbidity test or as thymol barbitone test. The work of Dr. McCord's group, using this test, had shown a fair validity in picking out certain liver diseases, which might possibly be quite apart from carbon tetrachloride poisoning. His group had found that this test provided a good indication of damage in animals as a result of toxicity from carbon tetrachloride. Work had been done both with rabbits and rats. Their animal experimentation with rabbits had shown systemic effects from exposures to 80 parts per million of carbon tetrachloride within one week, and from exposures down to 40 ppm. lasting two weeks. The recent experimentation tended to indicate that the tests used were not necessarily positive tests for gamma globulin. It had been their thought that these tests were measuring changes in phospholipins, which are a product of disturbed metabolism. He suggested that the work which they had done would definitely indicate that concentrations of carbon tetrachloride to the extent of 40, 60, or 80 ppm in small animals, especially rabbits, induced increased quantities of phospholipins in the bloodstream. He believed that this research indicated a method of test which might be used to determine early changes in human beings due to carbon tetrachloride which might otherwise be unobserved. He announced that the results of this research would be published in the near future.

Mr. Low stated that the manufacturers of carbon tetrachloride had been quite active in attempting to find some organization which would undertake research on the toxicology of this substance. He recalled that the amount of carbon tetrachloride used industrially was very large. The manufacturers had been making over 200,000 tons a year and they realized that the future use of this product must be so controlled that it will not cause injury.

The Chairman remarked that he had been one of those who had cast a negative vote on the last letter ballot of this subject. He had come to the conclusion that it would be very difficult to get agreement on this subject until additional research had been done to clear up the question of whether there was actually damage to human beings from concentrations of less than 100 ppm. Mr. Bowditch brought out that many state regulatory bodies are now adopting concentrations for carbon tetrachloride and that a great many of these are being placed between 50 and 75 ppm.

Dr. Kehoe recalled that earlier in the meeting it had been agreed that when dealing with new problems if the information was not available to establish a standard that a tentative standard be considered. He believed that carbon tetrachloride had been discussed so thoroughly and there was such a definite difference of opinion that he did not believe the Z37 Committee should establish any standard on this subject until enough evidence had been presented, presumably as the result of further research, so that a concensus could be established in this committee in favor of the standard so that any fair-minded person desiring to use the standard would realize that it had been based on sound facts and not an arbitrary figure which might be arrived at through compromise.

Mr. Ainsworth recalled that the extensive work which the Z37 Committee had done on carbon tetrachloride had become general knowledge and that nearly everybody concerned with this substance was waiting to see what action the Z37 Committee would take. He therefore did not believe that it would be wise to just table this substance and discharge the subcommittee. If no information were made available to the public other than the fact that work had been discontinued on this substance, it might be of real detriment to the prestige of this committee. He therefore suggested that a clear-cut statement or report of the present situation with regard to carbon tetrachloride should be prepared. This report could be published separately or could be included in the magazine, INDUSTRIAL STANDARDIZATION, which is published by the ASA, with additional copies available so that any group which is interested in this subject would be able to know the facts behind the work of the committee on this substance. Mr. Stratton suggested that this subject was so important generally that even though it were tabled temporarily by this committee that the subcommittee on carbon tetrachloride should be continued. He recalled the request of the present subcommittee to be discharged. He was not particularly concerned whether the present subcommittee was continued or a new one appointed, but he believed that by the continuance of a subcommittee it would be able to follow up developments which might come as a result of further research.

Mr. Snell stated that he agreed with Mr. Stratton. He remarked that various states are now adopting permissible limits for carbon tetrachloride and he believed that this subject was very important. He suggested that if considerable time elpased before the research was completed, certainly the various insurance companies and state authorities would have furtner reports on carbon tetracnloride poisoning and it might be that through a study of these reports additional information might be made available which would help in determining the permissible concentration.

Mr. Low remarked that it had been the feeling of the subcommittee that on the basis of existing evidence 100 ppm was a safe standard for systemic injury from carbon tetrachloride and until further evidence became available they could not conscientiously recommend a lower standard. None of the members of the subcommittee had wished to stand in the way of progress on this standard and they had therefore tendered their resignation with the thought that the Z37 Committee might wish to appoint another subcommittee to continue work on this substance. As far as he personally was concerned he would be perfectly willing to remain on the subcommittee if that was the desire of this committee, and he believed that that would be the feeling of the other members of this subcommittee.

Upon motion by Dr. Kehoe, seconded by Mr. Schrenk, it was

VOTED

that work on carbon tetrachloride should be temporarily held in abeyance pending further information and that the Chairman should be instructed to deny the request of the subcommittee that it be discharged in order that new information as it becomes available can be considered by the subcommittee.

After further discussion upon motion by Mr. Bowditch, duly seconded, it was

VOTED

that the ASA staff be requested to prepare a statement concerning carbon tetrachloride, which might be published or given out to those concerned on this subject.

The Chairman in the name of the committee thanked Dr. McCord for the work which he had done on carbon tetrachloride and the report which he had presented at this meeting.

112. Trichloroethylene (Min 95). The Secretary reported that the second draft on Trichloroethylene, including the changes which had been approved at the meeting of September 30, 1944, had been circulated to the various state health departments. Their comments were compiled and circulated to the full Z37 committee (Z37/190). All the comments were discussed in detail. After discussion it was agreed that in section 2.1 the suggestion of the New York Department of Labor be incorporated by omitting "non-flammable" in the first sentence and adding an additional sentence between the first and second sentence as follows: "It is practically non-flammable at ordinary temperatures but at higher temperatures under favorable conditions it may form weakly combustible mixtures with air."

In connection with 2.2 there was some discussion regarding solubility, as to whether this should be "relatively insoluble", "slightly soluble", or "relatively soluble".

Upon motion by Dr. Neal, seconded by Dr. Kehoe, it was unanimously

VOTED

that the portion on solubility in paragraph 2.2 be deleted from the draft.

The committee agreed that the last two words of 2.2 "inadequate ventilation" be changed to read "improper operating conditions."

There was some discussion about the wording "Repeated exposure" in 2.3, and its meaning in this particular instance. Finally it was agreed that this should be changed to "Prolonged or frequently repeated...." It was agreed that the third sentence of this paragraph would be clearer if it read "Concentrations higher than 200 ppm.."

Mr. Ainsworth recalled that the standard on trichloroethylene had been prepared as a war standard. Since the committee had voted to have all war standards reconsidered for approval as regular American Standards, he questioned if Trichloroethylene should still be treated as a war standard.

Upon motion by Mr. Stratton, seconded by Mr. Bloomfield, it was unanimously

VOTED

that the standard on Trichloroethylene be submitted as an American Standard rather than as a War Standard.

After further discussion of the comments received, upon motion by Mr. Bloomfield, seconded by Mr. Stratton, it was

VOTED

that the draft of trichloroethylene, as amended at this meeting, be sent to letter ballot of the full Z37 committee with recommendation for approval as American Standard.

113. Fluorine and Fluorides (Min 96). The Chairman recalled that the subject of Fluorine and Fluorides had been discussed at previous meetings but no definite action had been taken, primarily because of lack of information. He asked Dr. Neal as chairman of the subcommittee on this substance, if he had further information at this time.

Dr. Neal stated that since the last meeting a small amount of additional information had been made available but apparently there still were not enough facts to resolve the differences of opinion which existed among the member of his subcommittee. He reported that some people had set an arbitrary limit of 6 ppm whereas other groups of equally good authority had set a limit of 3 ppm. Both of these were apparently quite arbitrary and there did not appear to be any facts in the literature to resolve this difference.

Dr. Kehoe believed that although it might be possible to establish a standard on hydrogen fluoride at the present time that as far as the fluoride dusts were concerned, it might take several years before sufficient evidence would be available to make a reasonable conclusion.

Dr. Neal said that the situation was further complicated by the fact that some public health authorities were now starting to use fluorides at the rate of 1 ppm in drinking water as a health measure to prevent tooth decay. He also recalled that certain fluorides were now being used in insecticides and the public health authorities had established arbitrary standards for the concentration of fluorides on fruits and vegetables in order to protect the public from too high a concentration.

The Chairman called attention to the fact that the authorities that had been responsible for fluorides in water and on fruits and vegetables had taken an arbitrary stand but had come out with a definite answer, which in some cases was now being enforced as law. He wondered if this committee could not possibly take a similar stand because of the interest in industrial exposures and come out with some figures that would help in the occupational control of this substance until further information became available.

Dr. Cranch brought out the fact that as far as the

fruits and vegetables were concerned fluorine was usually present in one of two compounds whereas in industy the compounds of fluorine varied all the way from gases on the one hand to highly insoluble fluorides on the other hand and he doubted if a single standard could be set to cover all of these conditions.

Dr. Kehoe thought that on the question of fluoride dust it would be necessary to base a standard on physiological considerations rather than on a definite concentration of dust in the air. This led to two difficulties, first at the present time there were two sources of information that were in disagreement, one of these held that when fluorides in the urine were in the order or magnitude of 2 milligrams per liter there was evidence of retention of fluorides in the body, the other source of information considered that the concentration would be 4 milligrams per liter rather than 2 before fluorides were retained by the body. The second problem was concerned with the significance of fluoride retention in tissues of the body. He did not think that anybody knew definitely the relation between retention of fluorides in the body and injury or disease. He therefore considered that from this point of view the committee would have to take an arbitrary stand on this issue. He questioned if the committee could produce reasonable evidence at the time to show what fluoride retention in the body would lead to industrial ill health. He therefore thought that there was a far better basis for a standard on hydrogen fluoride than on the fluoride dusts.

The Chairman suggested that Dr. Neal's committee continue to work on this problem in the hope that they might bring in a recommendation for both fluorine and fluorides, but if this was found to be impractical, to bring in a recommended standard for hydrogen fluoride, if possible.

114. Silica. Dr. Gardner, chairman of the subcommittee, reported that he had been unable to get his entire subcommittee together in the last several months, but had had informal discussions with members of the committee. They felt that they were not in a position to write a standard for Silica, as the old arguments still applied. Silica was a slow-acting substance producing chronic disease and did not have the same effect on all individuals exposed. Its reactions varied not only according to the physiological makeup but also with the presence or absence of associated infections of the lung. Its effect was modified by other substances that might be locally present. Therefore, the subcommittee was of the opinion that it was impossible to write a standard which would be universally applicable in all industries, and asked that they be relieved of the responsibility of trying to write such a standard. Mr. Stratton stated that in view of recent action of one of the states requiring medical examination of workers exposed to Silica and the fact that some states had published standards for this substance, there should be a standard available on the subject from the ASA. Dr. Lanza stated that if the ASA wished to accept a standard in the absence of the background which most people considered important to determine

a standard, that might be a practical solution to the difficulty in this instance. Dr. Yant stated that it might be more desirable to consider good practice levels to be maintained rather than thinking in terms of injury or non-injury; that many people use standard allowable concentrations with the thought that if you were one or two percent above the maximum you were going to hurt somebody and if you were five percent under it there was no hazard at all; that if there was an accepted procedure and it did the job of control of dust in industry in accordance with modern practice, that would probably solve the problem. Dr. Gardner was asked to continue with his committee, and based on the discussions at the meeting try to prepare a report on what was considered good practice.

115. Methyl Chloride (Min 98). Dr. Schrenk, Chairman of the subcommittee on Methyl Chloride reported that they did not have information at hand to decide on a definite level; however there was work presently being carried on by Dr. Neal which he believed would give the information they needed. They hoped that before too long they would have the answer on methyl chloride. The answer would depend on adequate information, which was in the making and not theoretical.

116. Radium and Radon Gas (Min 101). Dr. Greenburg, Chairman of the subcommittee on Radium and Radon Gas, reported that his subcommittee had held two meetings on December 28, 1944 and January 20, 1945, respectively. Among other things this subcommittee had discussed a proposed code on radium exposure which had been prepared by the New York Department of Labor. This tentative code had been prepared on the basis of a maximum allowable concentration of 10^{-12} curies per liter of radon gas in the exhaled breath of workers employed in radium dial painting. The members of his subcommittee had been as follows: L.F. Curtiss, R.D. Evans, G. Failla, F.E. Hoecker, P.A. Neal, W.L. Cook, C.B. Lee. At the meetings of the subcommittee Dr. Failla and Dr. Hoecker had recommended that the standard should be based on the amount of radium stored in the body rather than based directly upon the concentration of radon gas in the expired breath. Their recommendation had been on the basis that the damage to the body was caused by the stored up radium and that the relation between radium in the body and radon in the exhaled breath was influenced by certain metabolic characteristics of the person, such as their weight, rate of respiration and depth of respiration. They had set up a somewhat simple formula;

$$\left(\begin{array}{c}\text{Total Radium in Body}\\ \text{in micrograms}\end{array}\right) = 8 \times 10^9 \frac{cV}{?}$$

Where c = the average net concentration of radon in the expired air expressed in curies per liter.

? = the average volume of air exhaled per minute, expressed in liters.

f = the fraction of the total amount of radium to which the radon in the expired air may be attributed (that is, the relative amount of so-called "freely emanating radium").

After further discussion at the subcommittee meeting it had developed that this formula was based on several assumptions which might possibly be open to contention. The whole problem was further complicated by the fact that a new employee might develop a high concentration of radon gas in the expired breath, but upon separation from the exposure for two or three weeks the radon content would decrease rapidly whereas if an employee had been engaged at this operation for several years he might because of the quantity of fixed radium in the body show very little reduction in the radon content in the expired air upon removal from the exposure.

At the last meeting of this subcommittee there had been a division of opinion as to whether the standard should be based upon Dr. Failla's formula or upon the radon content of expired breath. The problem had been put up to Dr. Greenburg for decision but he had refused to take a stand for either side because he believed that he did not have enough factual information upon which to decide the issue. He further reported that after the second meeting Dr. Curtiss had resigned from the subcommittee. Dr. Greenburg gave this complete report in the hope that he could receive suggestions or instructions from this committee which would help to resolve the differences within the subcommittee. He had considered adding more men to his subcommittee in the hope of developing additional facts on the subject.

Dr. Neal suggested that some time after next March there might be additional information on radio-active substances available and that some of the men responsible for this research might then be in a position to serve on this subcommittee. As soon as their work had been published, they would be in a position to supply information which might help to clear up the differences. He also thought that it was important that Dr. Curtiss continue to work with this subcommittee because of the valuable work which had been done on this subject by the National Bureau of Standards.

After further discussion by the Chairman and Messrs. Kehoe, Ainsworth and Lanza, upon motion by Mr. Bloomfield, duly seconded, it was

VOTED

that it was the recommendation of this Committee that the subcommittee on radium and radon gas should be enlarged at the discretion of its chairman and the work should be continued on these two substances.

117. New Substances (Min 100). The Chairman recalled that Dr. McCord, as Chairman of the Subcommittee on New Substances had given a complete report at the last meeting. Due to travel restrictions and the presssure of war work no subcommittees had been appointed. Dr. McCord's committee had suggested that work be started on the following new substances:

Sulfur Dioxide
Welding Fumes
Nitroparaffins
Chlorine
Chlorinated Napthalenes
Cyclohexane, Cyclohexanol, Cyclohexanone.

It was brought out as a result of a question from Mr. Low that this list had been established after consulting all of the members of this committee. It had also been agreed that the personnel of the subcommittee on new substances should be reviewed in order that some of the members might be relieved of this duty and new members added.

After further discussion by Messrs. Bloomfield, Bowditch and Neal, upon motion by Mr. Bloomfield, seconded by Mr. Burney, it was

VOTED

that subcommittees be appointed by the Chairman to develop standards on the various substances listed above.

Upon motion by Mr. Stratton, seconded by Mr. Bloomfield, it was

VOTED

that the Chairman should appoint new members to serve on the subcommittee on new substances and the subcommittee should be established on a permanent basis, in order that it might receive suggestions and make investigations and reports as to the need for and advisability of preparing standards on new substances.

118. Election of Officers. The Chairman reported that in a discussion with Mr. Ainsworth concerning a contemplated change in the Secretaryship he had suggested that the work of this committee might go along faster if there were a change of officers. He recalled that he had held office for several years and as a result of the discussion he had asked that the subject be brought up at this meeting.

Mr. Ainsworth explained that some years ago this committee had requested the ASA to appoint one of its staff to serve as

Secretary of the committee. Mr. Ainsworth had been appointed and had served as Secretary for some time. The ASA had now reached the decision that it was necessary for him to give up his position as Secretary of the committee because of other added duties and responsibilities. In discussing the appointment of a new Secretary of the committee the Chairman had suggested that there should also be an election to the offices of Chairman and Vice-chairman. Mr. Ainsworth recalled that the ASA had considered it good policy to hold periodic elections of officers of sectional committees to prevent the work of committees slowing down through inactivity of the officers. The ASA had been entirely satisfied with the progress which had been made by the Z37 Committee.

In connection with the Secretaryship Mr. Ainsworth announced that Mr. Lamb had been appointed to succeed him as Secretary of this committee. Mr. Ainsworth would still keep close contact with the work of this committee and advise Mr. Lamb on all important matters. He also recalled that Mr. Hayes of the ASA staff was also available for any service that might be needed in addition to Mr. Lamb. He therefore felt that he could relinquish the position of Secretary and leave this work in good hands.

Upon motion by Mr. Bowditch, duly seconded, it was unanimously

VOTED

that the Secretary be instructed to cast one vote for the reelection of the present Chairman of the Committee.

The Chairman recalled that Dr. Selby was Vice-Chairman of the committee. Dr. Selby had been unable to attend this meeting but had been talking with the Chairman by telephone previous to the meeting. So far as could be determined Dr. Selby was still willing to serve as Vice-Chairman of the committee.

Upon motion by Mr. Bloomfield, seconded by Mr. Stratton, it was unanimously

VOTED

that Dr. Selby be reelected as Vice-chairman of this Committee.

Adjournment. The meeting adjourned at 4:40 p.m.

Henry G. Lamb
Secretary

Reported by
F. Kwartler
P.H. Gruver

1-9-46

ASA
AMERICAN STANDARDS ASSOCIATION
70 East Forty-fifth Street, New York 17 N Y

Z9/27
November 14, 1947

To the Members of the ASA Sectional Committee
for the Safety Code for Exhaust Systems, Z9:

Gentlemen:

This memo has been prepared to inform the members of the Z9 committee of certain facts regarding the status of the work at the present time, and to set forth matters which might be considered at the meeting of the Z9 committee on December 5, 1947.

The entire committee has been reorganized according to the American Standards Association requirements for a safety code sectional committee. Mr. Cyril Ainsworth of the ASA staff has acted as Secretary of the committee for many years. The Chairmanship is at present vacant.

The scope of the Z9 project is as follows:

> "Standards for the design, operation and maintenance of equipment to provide a safe atmosphere by removing harmful substances from their point of production or issuance and by safely disposing of such substances; and such supplementary standards on personal protection as may be necessary to prescribe methods for the protection of workers."

The sectional committee has developed the Fundamentals Relating to the Design and Operation of Exhaust Systems, published in 1936. The Introduction to the Fundamentals Relating to the Design and Operation of Exhaust Systems says "Industrial processes differ markedly.....in their characteristics with respect to the application of exhaust ventilation, and it is not possible to prepare one set of specifications and regulations which will suffice for the successful design and operation of every exhaust system. Each process constitutes an independent problem. There are, however, certain fundamental requirements common to all exhaust systems which should serve as the basis of design in every case". In view of the fact that these Fundamentals were developed in 1936 the time elapsed may have given the industry an opportunity to develop information, data or opinion as to its correctness, applicability and usefulness, which might lead to modifications in the light of present day experience. Dr. Theodore F. Hatch had a committee considering changes in 1941, which were not effectuated.

The Z9 committee has also developed Safety in Electroplating Operations, Z9.1. This standard had wide distribution. It was adopted in 1941 and may be considered for reaffirmation or revision by the committee.

The Z9 committee also considered Grinding, Polishing and Buffing Equipment Sanitation, a standard developed by the Industrial Hygiene Codes Committee of the American Foundrymen's Association, submitted to the ASA and approved as American Standard in 1941.

The committee has before it in the form of a "Code of Recommended Good Practices" a standard for Metal Cleaning Sanitation, also developed by the AFA Industrial Hygiene Codes Committee and approved by its Board of Directors for use in the foundry industry. There have been proposed a series of modifications in the Metal Cleaning Sanitation Code as submitted by the AFA, which have been worked out in correspondence between the American Foundrymen's Association and the members of the Subcommittee on Abrasive Cleaning of the Z9 committee. If some impetus were given to this code it would be possible for the Z9 committee to consider it for adoption as an American Standard. It contains specifications relating to alkaline cleaning, solvent cleaning, solvent degreasing, metal pickling, tumbling mill cleaning and abrasive blasting, with exhaust specifications relating to each of these headings.

The committee has organized several subcommittees to handle other phases within the scope of the Z9 project. (These subcommittees may have to be reorganized in the light of changes in the personnel of the committee. It will probably be well for the Z9 committee, however, to review the scope and desirability of continuing the work of these subcommittees.) The subcommittees are Plan and Scope, Abrasive Cleaning, Rock Drilling, Granite Cutting (a draft for granite cutting dated October 4, 1940 was circulated to the committee and others, but no final action was completed), and Electroplating (which latter completed its work in the development of the present Safety In Electroplating Operations, Z9.1-1941). It might be suggested that those who are on the committee at the present time, and who were active in the work of these subcommittees, be prepared to present to the sectional committee the present status of any work which may have been developed within the subcommittees of which they were members.

In view of the statement quoted above from the Introduction to the Fundamentals, it might also be suggested that representatives of the organizations on the Z9 committee review the work of their own associations in order to learn whether or not there have been any sets of specifications and regulations developed by their organizations which could form codes for the "incipement problems" mentioned in the Introduction to the Fundamentals. It is quite possible that recent developments or techniques developed in their industries may have reached the point where they may be considered for standardization by the sectional committee.

29/27
November 14, 1947

This outline may constitute a tentative agenda for the committee's consideration on [illegible]ember 5. However, as an active representative of your orga[illegible]zation we solicit your suggestions and ask you to send them as soon as possible, for inclusion in a final agenda for the meeting.

Very truly yours,

Cyril Ainsworth

Cyril Ainsworth
Secretary Z9

JH

ASA
AMERICAN STANDARDS ASSOCIATION
70 East Forty-fifth Street, New York 17 N Y

Z9/29

PRIVATE COMMITTEE DOCUMENT
NOT FOR PUBLICATION

M I N U T E S

ASA SECTIONAL COMMITTEE ON SAFETY CODE FOR EXHAUST SYSTEMS, Z9

December 3, 1947

(Subject to Confirmation)

The meeting was called to order by Mr. Henry G. Lamb of the ASA staff, who acted as chairman, at 9:40 a.m. in Room 2946, ASA offices, 70 East 45th Street, New York City.

Present

Brandt, Allen D	American Public Health Assn
Brush, Harold F. (rep Alex Martin)	National Assn of Fan Manufacturers
Cranch, A.G.	International Acetylene Assn
Dorfan, M.I. (alt for W.O. Vedder)	Foundry Equipment Mfrs Assn
Hatch, Theodore F.	American Industrial Hygiene Assn
Hoffman, E.E.	National Paint, Varnish & Lacquer Association
Meigs, Ralph R.	National Association of Mutual Casualty Cos
Renes, Lucian E. (rep H.E. Seifert)	U.S. Public Health Service
Stern, Arthur C.	American Society of Mechanical Engineers
Stratton, Reuel C.	National Conservation Bureau
Vedder, W.O.	Foundry Equipment Mfrs Assn
Wallace, William M., II	American Society of Heating and Ventilating Engineers
Harris, W.B.	American Conference of Governmental Industrial Hygienists
Ainsworth, Cyril	ASA Staff
Hayes, D.F.	ASA Staff
Lamb, H.G.	ASA Staff

Absent

Anderson, D.G.	National Founders Association
Blake, R.P. (alternate)	International Association of Industrial Accident Boards and Commission
Farrell, Arthur A.	International Association of Governmental Labor Officials

Absent (cont)

Greenburg, Leonard	Member-at-Large
Kane, John M.	Dust Control Equipment Association
Bureau of Ships rep	U.S. Department of Navy
Katz, S.H.	U.S. Department of War
Kelsay, Ray	U.S. Department of Labor
Massari, S.C.	American Foundrymen's Association
Miner, H.L.	Manufacturing Chemists' Assn of the United States
Monroe, R.W.	National Electrical Mfrs Assn
Schrenk, H.H.	Bureau of Mines
Silverman, Leslie	Member-at-Large
Witheridge, W.N.	National Safety Council

Review of Past Work of Z9 Committee. After an introduction of those present, Mr. Ainsworth outlined the history of the Z9 project, stating that it had originated as far back in ASA history as 1920. He stated that it had begun as a part of the basic ASA safety standards program, and that in those early days there was not a full understanding of what was necessary to produce national standards. The committee, therefore, had had difficulty in getting started. This did not mean that there was not a need for national standards in the field of exhaust ventilation, for the committee had eventually produced the Fundamentals Relating to the Design and Operation of Exhaust Systems, and this code had been very widely used.

He also stated that the Z9 committee had under its jurisdiction Safety in Electroplating Operations, Z9.1, Grinding, Polishing and Buffing Equipment Sanitation, Z43, a proposed Metal Cleaning Sanitation Code and one on Abrasive Cleaning, Rock Drilling and Granite Cutting, and it eas important that the Z9 committee should be up to date in order to consider business arising in connection with these standards.

Purpose of the Meeting. Mr. Ainsworth stated further that the ASA was not a technical society, nor a trade association, nor a research organization, out was a means of coordinating and correlating the ideas of many people so that a single point of view could be established on particular items. He went on to say that the ASA machinery was particularly applicable to the field of exhaust ventilation because there were quite a few bodies at work, all interested in producing standards, and many regulatory bodies were considering the adoption of the codes among which there was very little uniformity. He stated that it seemed that the time had come for greater activity on the part of the Z9 committee to eliminate some of the confusion which existed in this field, and to establish a program which would be effective. He

explained that this did not mean that the work at present being done by the groups represented should cease, but rather that the Z9 committee should stimulate the groups interested to bring their standards to the sectional committee. Mr. Ainsworth then suggested that the committee discuss the picture as a whole before adopting a program, since this meeting was of an organizational and general nature.

Cooperation of Other Organizations. Mr. Stern inquired if it would be possible to get into the record the work which was being carried on by the various organizations. He stated that he had personal knowledge that the American Conference of Governmental Industrial Hygienists was working on exhaust system codes. On this point Mr. Harris (a little later) explained that the American Conference of Governmental Industrial Hygienists had a committee which was working on codes for use by governmental bodies. He believed, however, that one of the essential problems to be decided before codes were written by the ACGIH or by any other groups was the question of upon what basis codes should be written.

Summary of Problems. The question of the basis upon which exhaust codes should be written arose in connection with this conversation and at other points in the discussion of the committee. Dr. Hatch summed it up at one point by indicating that there were three kinds of codes; 1) those which set up a maximum concentration, having no specifications at all regarding engineering design; 2) a second type was a code which was primarily an engineering document, which it must be assumed was so good that if the engineering specifications therein were followed the hazards would be eliminated; 3) a code which contained standards of accomplishment and requirements as to how the structure should be designed to meet standards of accomplishment. In presenting this picture of the type of codes which were at present being considered in the field, Dr. Hatch also stated that a good many codes that were being written for regulatory use were being drawn up without adequate representation from industry. He pointed out that there was an additional difficulty in the fact that the administrative set-ups varied from jurisdiction to jurisdiction. The committee agreed that it ought to first enunciate a principle upon which it could proceed in its work. It was stated that there were already existing ASA committees that had been turning out recommendations for allowable concentrations, and that it would seem to be a duplication of effort if the Z9 committee were to try to direct its efforts toward the establishment of concentration in various industries from which to start its work.

Fundamentals Relating to the Design and Operation of Exhaust Systems. As the committee's discussion proceeded, it seemed that the consensus of the committee was that the Z9 code on "Fundamentals" had stated standard requirements sufficiently upon which the committee could base standards for engineering practice, although it was suggested that it might be necessary to review the "Fundamentals" in order to bring its provisions up to date. This discussion also developed the thought that heretofore codes had been developed for "industries," but technical details relating to the exhaust ventilation prescribed for one industry were also applicable in some other industries, although the materials were not the same but their physical characteristics could be handled by the same duct work or principles of exhaust.

Mr. Stern then suggested that it might be wise to prepare a "process" breakdown rather than a set of codes for individual industries, and from these processes develop the fundamentals of design discussed earlier in the meeting. The question was raised as to whether or not these fundamental requirements for design in various operations might not still be found in the "Fundamentals Relating to the Design and Operation of Exhaust Systems," which had been produced by the Z9 committee in 1936 as a report, but not as an approved American Standard.

Upon motion by Mr. Stern seconded by Mr. Harris it was unanimously

VOTED

that the subcommittee which had developed the "Fundamentals Relating to the Design and Operation of Exhaust Systems - 1936" be reactivated with a view to expanding or revising them and

that the chairman of the subcommittee was to select the members of his subcommittee and

that the subcommittee should make recommendations to the Z9 committee.

Dr. Brandt was selected chairman of this subcommittee.

Subcommittee to Study "Operations". Discussion followed on the possibility of duplication of the work of the Z9 committee, because there were other organizations active or considering activity in writing codes or standards in the exhaust ventilation field.

Mr. Ainsworth explained that in the organization of a sectional committee every effort was made to have all interests represented, and that therefore duplication could and should be avoided. He stated that the sectional committee should stimulate activity, and that if interested organizations were to produce standards, the work should be brought into the Z9 committee for consideration of its value with regard to national adoption by means of the Z9 committee through ASA.

There was a general discussion of ways and means of implementing this thought and upon motion by Mr. Stern seconded by Dr. Brandt it was unanimously

VOTED

that a subcommittee be set up, whose purpose would be to study the "Operations" as distinguished from industries in which standards could and needed to be promulgated and

that the chairman of the subcommittee was to select the members of his committee and

that this subcommittee was to report back to the main Z9 committee.

Mr. Stern was selected chairman of this subcommittee.

Safety in Electroplating Operations, Z9.1-1941. Because earlier in the meeting it had been suggested that a review or revision of Safety in Electroplating Operations, Z9.1-1941, be undertaken and a subcommittee set up for this purpose, the earlier action was withdrawn and the Z9 committee agreed that electroplating be considered along with the "operations" which were to be studied within the scope of Mr. Stern's subcommittee.

Plan of Work. In the work of the Z9 committee prior to the war there had existed a Subcommittee on Scope and Purpose. Discussion revolved around whether or not this committee should be reorganized or reactivated. Some members of the committee felt that there was a need for revival of the old Scope and Purpose Subcommittee, whose task would be to review the field of activity and also possibly to be available for questions of a general nature which might be submitted to the Z9 sectional committee. Others of the committee felt that the Z9 committee as a whole had as one of its main purposes

the establishment of policy in regard to the direction of the work being undertaken. It was considered that there might be reason for the Z9 committee to be informed about the work of other organizations insofar as the work of its scope was concerned, and after further discussion and upon motion by Mr. Stern seconded by Dr. Brandt it was unanimously

VOTED

that a subcommittee be appointed to review the present situation in the field of exhaust ventilation, studying the work of other organizations or committees in other organizations in the field of exhaust ventilation to determine what the nature of their work was and how the scope of the Z9 committee's work would be affected, and

that the chairman of the subcommittee was to select the members of his subcommittee and

that this subcommittee was to report back to the main Z9 committee at its next meeting.

Mr. William Harris was selected chairman of this subcommittee.

Election of Chairman. Mr. Lamb, the presiding chairman, pointed out that the chairmanship of this sectional committee had been vacant for several years, and it was in order to elect officers at this meeting. Upon motion by Mr. Wallace, seconded by Dr. Brandt, it was

VOTED

that a Nominating Committee be selected to nominate candidates for the position of chairman.

As chairman pro tempore, Mr. Lamb appointed Messrs. Stratton, Fedder and Cranch, who recessed to an adjoining room and returned to report that the Nominating Committee had selected Dr. Hatch as their unanimous nomination for the position of chairman. On motion by Mr. Harris seconded by Dr. Brandt it was

VOTED

that the nominations be closed.

Mr. Lamb announced the new chairman, Dr. Hatch, who then assumed the Chair.

Z9/29
December 3, 1947

Plans for Next Meeting. A date for the next meeting of the sectional committee was discussed, and it was tentatively planned for Friday, April 2, 1948 in New York City, subject to the call of the chairman.

CYRIL AINSWORTH
Secretary Z9

DFH-FH

January 28, 1948

ASA
AMERICAN STANDARDS ASSOCIATION
70 East Forty-fifth Street, New York 17, N Y

Z37/216

NOT FOR PUBLICATION

M I N U T E S

ASA COMMITTEE ON MAXIMUM ALLOWABLE CONCENTRATIONS OF TOXIC DUSTS AND GASES, Z37

December 9, 1947
(Subject to Confirmation)

The meeting was called to order by the chairman at 10:10 a.m., in Rooms 2944-46 of the Grand Central Terminal Building 70 East 45 Street, New York 17, N.Y.

Present

Yant, W.P., Chairman	(MatL)	Lanza, A.J.	(MatL)
Bloomfield, J.J.	(APHA)	McCord, C.P.	(AAofIP&S)
Bowditch, Manfred	(MatL)	Sands, F.W.	(NSC)
Cranch, A.G.	(MatL)	Schrenk, H.H.	(USDI BM)
Drinker, Philip	(MatL)	Selby, C.D.	(MatL)
(also alt for R.A. Kehoe)	(AIHA)	Skinner, J.B.	(IAGLO)
Greenburg, L. (ACGIH LIAIABC)		Sehl, F.W.	(MatL)
Gurney, S.W.	(NAMCC)	Snell, M.A.	(NCB)
Hamilton, Alice	(USDofL)	Stratton, R.C.	(AIofCE)
Kay, Kingsley	(CSA)	Woody, McI.	(API)

Bonsib, R.S., Alternate (API)
Chapman, G.H., Alternate (NAMCC)
Cook, Warren A., Zurich General Accident & Liability Insurance Company Ltd
Irish, D.D., Dow Chemical Co
Low, F.S., Westvaco Chlorine Products Corp
VanAtta, F.A., Alternate (NSC)

Ainsworth, C., ASA Staff
Lamb, H.G., ASA Staff

Absent

Bishoff, F.M.	(USWD)	Neal, P.A.	(FSA PHS)
Drinker, C.K.	(MatL)	Osborn, Stanley H.	(CSPHA)
Foulger, John H.	(MCA)	VonOettingen, W.F.	(MatL)
Haggard, H.W.	(MatL)	Vosburgh, B.L.	(MatL)
Hatch, T.F.	(MatL)	Watson, C.H.	(MatL)

The chairman introduced the following new members of the committee: Mr. J.B. Skinner, representing the International Association of Governmental Labor Officials, Dr. Kingsley Kay, liaison representative of the Canadian Standards Association, and Mr. F.W. Sands, representing the National Safety Council.

119. Approval of Minutes. The secretary reported that the minutes of the last meeting had been circulated as Z37/206. After a brief discussion, these minutes were approved as circulated.

120. Silica (Min 114). The chairman reported that Dr. Lanza had assumed the chairmanship of the Silica Subcommittee, since the demise of Dr. Gardner, who had been chairman. Dr. Lanza explained that he had assumed chairmanship of this committee so recently that he had not had an opportunity to function properly or to call a meeting of the subcommittee. He further explained that during the past two years, developments in exposures to silica had undergone new phases, as a result of which there was some confusion and he believed a good deal more of both research and clinical work would have to be done before they could formulate a standard on this substance. The chairman explained that if the Committee felt that it could not promulgate a regular standard at this time because of lack of information on which to base such a standard, it might be possible to prepare a tentative standard, or in case of furtner doubt, they could merely prepare a statement of the situation as it existed at this time, giving the reasons for not arriving at a standard and any other pertinent information available at the moment on this particular substance, so that anyone making inquiry from the ASA could at least be given the viewpoint of the committee.

Dr. Lanza agreed to prepare a statement on silica, for consideration by his subcommittee, after which it would be sent to the secretary for circulation to the full Committee, for comments and suggestions. If the Z37 committee indicated agreement on the statement, it could then be published; if, however, there were any objections, the comments and suggestions would be held for further discussion at the next meeting.

121. Fluorine and Fluorides (Min 113). The chairman reported that he had talked with Drs. Frary, Kehoe and Neal on this subject and they believed that they were not ready to recommend a standard on fluorine and fluorides. There was some good work going on at the present time, and there were indications that some additional investigations would be undertaken in the near future. It was hoped that enough information would be available within a reasonable time to justify waiting.

122. Methyl Chloride (Min 115). Dr. Schrenk, as chairman of the subcommittee, reported that his subcommittee was in unanimous agreement on one point, namely, that the maximum allowable concentration should not be more than 100 ppm. He read a letter he had received from Dr. Neal, in which Dr. Neal explained that he had discussed this subject with others and they were of the opinion that (1) The duration of exposure was at least as important as concentration; (2) The

duration of intervals between exposure was an important factor, and (3) There was a wide range of variability between individuals. Dr. Neal thought that methods of analysis routinely used in most plants were only roughly planned and if 100 was considered permissible, this lack of precision might lead to the acceptance of concentrations of several hundred, and that an atmosphere which showed 100 at the time of testing might at other times have a higher degree of contamination. He believed that a permissible limitation of 50 should be recommended.

Dr. Schrenk reported that the governmental hygienists in their last list had recommended 100 ppm. Dr. Irish reported on actual experiences they had had recently with methyl chloride and they had come to the conclusion that concentrations of 100 ppm would give them no difficulty provided they didn't have many peaks above this figure. Actually, there was no clean cut picture on the subject since no plant had a level of exposures, but if a plant did have a low level of exposure, they could tolerate some peaks; actually if they were dealing with an exposure in the neighborhood of zero, as was the case in many operations, with occasional quite high peaks, it would be possible to tolerate much higher peaks. Their experience had indicated that 100 ppm was not a bad standard provided they did not tolerate peaks beyond 200 ppm, and they got a reasonable amount of safety as a result.

After further discussion, upon motion by Dr. Schrenk, seconded by Dr. McCord, it was unanimously

VOTED

that the proposed standard on Methyl Chloride be submitted to letter ballot of the Z37 committee for approval as an American Standard.

123. Carbon Tetrachloride (Min 111). The chairman reported that he had a letter from Dr. von Oettingen, chairman of this subcommittee, that he had discussed the question with Mr. Low and Dr. Irish and they had agreed that they still did not have sufficient information to establish a standard on this substance.

Mr. Low reported that he believed that in view of the fact that studies and work on this substance were now going ahead, it would be unwise to attempt to promulgate a standard at this time. He added that the manufacturers of carbon tetrachloride had held a meeting about a year ago and approached the University of Rochester, which agreed to undertake a study of this on human subjects, beginning at limits that were so low that there would not be any trouble. They were particularly anxious to obtain information as to what

levels evidence of discomfort, headache, nausea, etc, appeared. At that time they learned that Dr. Irish was carrying on an elaborate program of experimental work, and the early results indicated that the limits might have to be set lower than had been contemplated. It was therefore deemed advisable to hold up the work they were planning until Dr. Irish had had a chance to conclude his work.

Dr. Irish stated that since carbon tetrachloride was a substance that had been handled for a great many years, and since it was very complex and very difficult of interpretation, he believed it would be well to finish their studies so that there would be a good solid foundation and basis upon which to set a standard. They had been working on this substance intensively for 3 or 4 years and he believed they were getting information that would give them a fairly firm foundation, and he believed that under the circumstances it would be more desirable to await the conclusions of their investigations before setting a standard.

Dr. Drinker pointed out that recent data collected by governmental hygienists, which had appeared in a recent issue of INDUSTRIAL HYGIENISTS' DIGEST had indicated that the states had adopted varying figures of 50, 75 to 100 as the MAC for this substance. Mr. Skinner reported that while Massachusetts had set 50 as the standard, they would rather see it at 35 because they had had cases, especially in young girls, with concentrations below 50. Dr. Hamilton raised the question as to whether it was the intention of this Committee to set the MAC at the point where discomfort, nausea, vomiting, etc, occur, or at the point where systemic poisoning occurred. Mr. Ainsworth believed that this committee had never indicated what it meant by an allowable concentration, either from the general point of view or in any individual instance, nor had there been any statement in any of the standards to indicate whether the standards had been set at the discomfort point or at the systemic poisoning point.

The chairman remarked that this committee had issued a statement in 1946, giving their position on carbon tetrachloride, and after further discussion, upon motion by Dr. Irish, seconded by Dr. Selby, it was unanimously

VOTED

that it was the sense of this committee that the statement on carbon tetrachloride 237.17/210 was still applicable to the present knowledge on this subject.

124. Radium and Radon Gas (Min 116). Dr. Greenburg, chairman of the subcommittee, reported that at the last meeting of the Z37 committee, he was authorized to expand his subcomittee, but due to the war conditions and the rapid developments that were occurring in the field, he had been unsuccessful until very recently. They had added Dr. Karl Morgan of Oak Ridge, Dr. James H. Sterner of Eastman Kodak Co who had had considerable experience during the war, and Dr. Bailey of the University of Rochester. He believed that within the next 3 or 4 months, his committee would be able to come to a conclusion on radium and radon gas, and he expected to have a final report ready for the committee at that time. He also indicated that there were several other scientists who could help his subcommittee, but these men were unavailable to attend meetings. It was his intention to carry on correspondence with all these people, so that his committee would have the benefit of their thoughts.

125. Cadmium (Min 106). The chairman recalled that the draft of the war standard had been prepared by the U.S. Public Health Service. After conferring with Dr. Neal, he had asked Mr. Bloomfield for a recommendation with regard to the cadmium standard. He had received a letter from Mr. Bloomfield, which suggested that the war standard for cadmium had proved satisfactory and recommending that it should be adopted as a regular American Standard.

Mr. Drinker agreed that the present concentration of 1 milligram per 10 cubic meters of air was a very desirable standard for workers exposed to cadmium fumes, such as from welding cadmium plated objects, but he did not believe that this concentration was a fair maximum to apply in the few large plants which were engaged in refining cadmium oxide. He recalled that there had been a recent paper in the Journal of Industrial Hygiene by Dr. Princi of the Medical School of the University of Colorado on this subject and he understood that this author was making a further study at the present time concerning the workers that handled the crude cadmium oxide. It appeared that there was a considerable difference between exposures to the olive drab dust in its crude form as compared to the fume given off from burning or from heating the cadmium metal.

Mr. Van Atta reported that his experience would bear out the thought that the crude cadmium oxide dust did not present as much hazard as the fume. There was considerable discussion as to whether it would be practical to have two standards on cadmium, one for the fume and the other for the dust, and also as to whether the committee should now approve a regular American Standard or whether further information was necessary, in which case a document might be prepared as a tentative standard.

Upon motion by Dr. Selby, seconded by Dr. Woody, it was

VOTED

that the Z37 committee issue the technical material contained in the present American War Standard Allowable Concentration of Cadmium as a tentative standard, and that the subcommittee on cadmium be instructed to continue to study this problem.

It was agreed that Dr. Princi and Dr. Dudley Irwin be invited to serve on this subcommittee.

It was further agreed that the editing subcommittee prepare a statement for inclusion in the tentative standard, to the effect that further work and study was continuing on this subject.

126. Manganese (Min 106). The chairman reported that the U.S. Public Health Service, Institute of Industrial Hygiene, which had almost solely handled the War Standard on Manganese believed that the war standard was satisfactory.

After some discussion, upon motion by Dr. Woody, seconded by Mr. Stratton, it was unanimously

VOTED

that the American War Standard on Manganese be submitted to letter ballot of the Z37 committee, with the recommendation that it be approved as a regular American Standard.

127. Arsenic (Min 106). The chairman recalled that Dr. Drinker had written to the Z37 committee some time ago, requesting reconsideration of the American War Standard Maximum Allowable Concentration of Metallic Arsenic and Arsenic Trioxide.

Dr. Drinker stated that he had no fault to find with the present maximum concentration of 1.5 milligrams of arsenic per 10 cubic meters of air for arsine. He thought that this ought to be around one or two parts per million, considering it as a gas. He did not, however, believe that there was data to support the concentration of 1.5 milligrams when considering arsenic trioxide. In fact, he believed that there was sufficient evidence available from the Public Health Service

and the non-ferrous mining industries to justify a higher value. He reported that Utah had arbitrarily set a value of 5 milligrams per 10 cubic meters and he did not believe that even this was high enough. He recalled that there had been a paper published in the Industrial Journal of Hygiene some time ago, reporting that there was something like 4 to 10 milligrams per meter of arsenic trioxide in ordinary tobacco smoke. It was his impression that the concentration of this dust was quite high in plants producing arsenic. Although there had been cases of dermatitis in these plants, he did not know of any cases of systemic arsenic poisoning.

Dr. Hamilton stated that her experiences confirmed Dr. Drinker's thoughts. She had been amazed to see how harmlessly this material was handled like sand. Dr. McCord asked if there was any possibility that the lack of systemic poisoning in this industry might be due to the fact that individuals built up a tolerance to this chemical. This matter of tolerance was considered in the medical profession when administering arsenic for therapeutic purposes. Both Dr. Hamilton and Dr. Drinker recalled that there was a reasonable amount of labor turnover in this industry and that therefore the fact of building up tolerance was not too important.

Dr. Selby asked if there was a real need for a maximum allowable concentration of arsenic. The chairman recalled that at the time of developing the war standard, there had been considerable discussion as to whether this should include arsine and arsenate of lead, but the standard had been specifically limited to metallic arsenic and arsenic trioxide. The standard had been developed as a war standard because of certain possible uses of arsenic in the war effort.

Upon motion by Mr. Bloomfield, seconded by Dr. Selby, it was

VOTED

that a letter ballot of the Z37 committee be taken on the withdrawal of the present war standard for arsenic, with recommendation for its withdrawal, and that a subcommittee be set up to consider, first, the need for a standard on arsenic and if a standard was deemed necessary, to make recommendations concerning the technical content of the standard.

Dr. Drinker stated that he did not wish to be a member of the arsenic subcommittee, but he would be very glad to make available to the committee the technical data which

was in his files.

128. Styrene Monomer (Min 106). The chairman reported that Dr. Irish, who had prepared the war standard on this substance, had stated that they had had a great deal of experience since the standard had been issued and he saw no reason for change. They had maintained their plant at 400 with no difficulties. Mr. Cook had favored 200 on the basis of statements of a number of people who had been in contact with it, suggesting that irritations developed at concentrations of less than 400.

After further discussion, upon motion by Dr. Irish, seconded by Mr. Sands, it was unanimously

VOTED

that the American War Standard on Styrene Monomer be submitted to letter ballot of the Z37 committee, with the recommendation that it be reapproved as a regular American Standard.

129. Xylene (Min 106). Dr. Greenburg, who had prepared the war standard, did not believe there was any need for change and upon motion by Dr. Woody, duly seconded, it was unanimously

VOTED

that the American War Standard on Xylene be submitted to letter ballot of the Z37 committee, with the recommendation that it be approved as a regular American Standard.

130. Cyclohexane, Cyclohexanol, Cyclohexanone (Min 117). The chairman reported that in accordance with the action taken at the meeting of November 20, 1945, Dr. Kehoe had been appointed as chairman of a subcommittee to prepare drafts of a standard on these three substances. Dr. Kehoe had advised the chairman by correspondence that his subcommittee had been formed and considerable progress had been made in preparing a draft on these substances.

131. Nitroparaffins (Min 117). The chairman announced that in accordance with the action taken at the meeting of November 20, 1945, Dr. Kehoe had also accepted chairmanship of a subcommittee to draft a standard on nitroparaffins. By correspondence Dr. Kehoe had reported that work was not quite completed, but he hoped to have a draft on this subject in the near future.

132. Chlorine (Min 117). The chairman recalled that at the meeting of November 20, 1945 it was agreed that a subcommittee should be formed to consider a standard on chlorine. He asked Mr. Stratton, in view of his war experiences with chemical warfare, if he would be willing to serve as chairman of such a subcommittee. Mr. Stratton accepted.

133. Welding Fumes (Min 117). The chairman asked Dr. Drinker if he would serve as chairman of a subcommittee to prepare a draft standard for welding fumes. Dr. Drinker accepted this assignment. He indicated that the U.S. Public Health Service was about to publish a study on welding fumes and he believed that it would be possible to prepare a draft very shortly after the publication of this report.

134. Research Committee. The chairman reported that this committee had been appointed for the purpose of ascertaining the situation with respect to research work now being done, what were good institutions to produce such work if they already existed, or what institutions had facilities that might be interested in doing such work. Dr. Kehoe, who was chairman of this committee, had reported that the committee had not done much nor had it come to any conclusions. It was Dr. Kehoe's intention to get information on the number, location and type of facilities available, for research in this field.

Dr. Irish was of the opinion that there were so few research facilities as compared to the need and demand for them that there would be many advantages in having additional facilities made available. It was the general agreement that if the Research Committee of Z37 assembled facts and came out with such a statement that it might prove beneficial.

135. New Substances (Min 117). The chairman recalled that at the last meeting, at Dr. McCord's suggestion, it had been voted to change the personnel of this committee. It had been agreed that Mr. Bloomfield should act as chairman, and the following members had been asked to assist him: M. Bowditch, A.G. Cranch, P. Drinker, W.J. McConnell, C.P. McCord, H.H. Schrenk. The chairman urged all members of the Z37 committee to submit any suggestions which they might have for new substances, which should be considered by this committee. There were two major factors in selecting a substance for standardization -- first, there should be an important need or new need for a MAC for the substance, and second, the substance should be one upon which there was sufficient information to justify a standard upon which the committee could agree.

It was suggested that there was a need for a standard on beryllium, but from the discussion which followed, it would appear that there was not enough information available at the present time upon which to base a standard.

Mr. Stratton reported that during the previous week Sectional Committee on Exhaust Systems, Z9, had met and in discussing their work they had agreed that they would look to the Z37 committee to set up maximum allowable concentrations for various substances and would consider that their work would then deal with engineering and design requirements to obtain these values. He therefore believed that the Z37 committee should endeavor to provide standards on substances which were of importance to the Z9 Committee. The chairman suggested that if it were possible for the Z9 Committee to indicate a list of substances in the order of their importance, such a list would be of great help to the Committee on New Substances.

The chairman reported that a letter had been received from Mr. P.W. Jacoe, Industrial Hygiene Section of the Colorado Department of Public Health, asking for information concerning a maximum concentration for zinc stearate. He was referring this letter to the Committee on New Substances for recommendation.

136. Safety in Photography. It was reported that the Sectional Committee on Standardization in the Field of Photography, Z38, had made a request to the American Standards Association that its scope be enlarged to include safety in the field of photography, including hazards to personnel. Dr. Fairhall had written to the ASA, calling attention to certain photographic chemicals. In the general discussion which followed, it appeared that most of the photographic chemicals which affected the safety of employees were of a nature affecting the skin rather than developing toxic dusts or gases. It was agreed that the Z37 committee was not particularly concerned with this subject.

137. Textile Safety Code. The secretary reported that recently the American Standard Safety Code for Textiles, L1, had been revised. In addition to bringing the standard up to date with regard to machine guarding, etc, the L1 Committee believed that there should also be a standard on temperature, humidity and dust control within textile plants. One of the members of that committee had thought that as far as the concentration of dust was concerned and perhaps also the maximum temperature and maximum humidity, these subjects should be referred to the Z37 committee.

Dr. Drinker announced that a study on control of dust in cotton textile plants had been going on over a two year period. This study had also included some work on temperature and humidity. In the discussion which followed it was generally agreed that the subject of dust in the textile industry was included in the present scope of the Z37 committee, but there was some question as to whether or not the present scope would include requirements on temperature and humidity.

138. Scope (Min 107). The chairman suggested that it might be well to consider the scope of this committee. At present it included maximum allowable concentrations of harmful gases, vapors, dusts, fumes, and mists.

In addition to the subjects of temperature and humidity, it was suggested that consideration might be given to inclusion of the concentration of harmful radiation, such as X-rays or radio active substances.

Dr. McCord suggested that in the future there might be a real need for maximum concentrations of ultrasonic vibrations. The secretary reported that the American Standards Association already had a committee on Accoustical Measurements and Terminology, Z24, but he did not believe that their scope would include setting limits concerning the harmful effects of vibrations.

Dr. Selby suggested that the consideration of nuisance dusts was becoming more and more important. Although these might not be considered as toxic, they definitely affected the comfort of workmen and sometimes played an important part in accident prevention.

Dr. Schrenk suggested that if the scope were changed to include industrial atmospheric environment, it might possibly be considered to include all of the items which had been discussed.

Upon motion by Dr. McCord, seconded by Dr. Woody, it was

VOTED

that it was the sense of this meeting that its scope should be enlarged to include additional subjects important in the industrial atmospheric environment in accordance with the discussion at this meeting, and that the Editorial Subcommittee be requested to prepare a detailed wording of a revised scope, and that this detailed wording be referred back to the Z37 committee for action.

139. Executive Committee. The chairman recalled that some years ago the Z37 committee had an executive committee of about 8 members, for the purpose of handling minor details for the committee and thereby conserve the time of all of the members of the main committee. In the discussion which followed it was explained that the executive committee would not have the responsibility or authority to adopt or reject standards.

Upon motion by Mr. Stratton, seconded by Dr. Drinker, it was

VOTED

that the Chair be empowered to appoint an Executive Committee of 8 or 10 members, in order to expedite the work of this committee between full committee meetings.

140. Drafting Committee. The chairman recalled that according to the records the Z37 committee had a Drafting Committee which had functioned in the past, but at the present each subcommittee on a particular substance had prepared its own draft, subject to approval of the Editing Committee, and the Drafting Committee did not appear to fulfill any particular function at the present time.

Upon motion duly made and seconded, it was

VOTED

that the Drafting Committee be discharged.

141. Susceptibility of Women and Childred to Toxic Substances (Min 80). The chairman reported that during the war a special subcommittee had been appointed to consider the possibility of special concentrations for women and children. This committee had not prepared any definite standards and, since the end of the war, it would appear that there was very little need for such standards.

Upon motion duly made and seconded, it was

VOTED

that the Subcommittee on Special Standards for Women and Children be discharged.

142. Personnel of Z37 Committee. The chairman recalled that through subcommittee work this committee had received considerable help from several men in the field of industrial toxicology, who were not members of the Z37 committee. There was a general discussion of possible new members of the committee.

Upon motion by Dr. Drinker, seconded by Mr. Bonsib, it was

VOTED

that Messrs. Warren A. Cook, Hervey B. Elkins, D.D. Irish, Willard Machle, Norton Nelson and Henry F. Smyth be invited to serve as Members-at-Large on the Z37 Committee.

143. General Policies Concerning Form and Content of Proposed Standards (Min 29). The chairman recalled that this committee had several years ago adopted a general format for the preparation of standards on various subjects. He believed that it was helpful to occasionally review such fundamental considerations to see whether or not improvements could be made.

Dr. Drinker reported that in his teaching work it had been difficult sometimes to explain that maximum allowable concentrations were not precise figures, but might indicate more nearly a range of hazards. He explained that he had considered the possibility of grouping substances into various zones for comparative purposes. By means of a blackboard he showed 5 proposed zones as follows:

Zone 1: Concentrations greater than 500 ppm for such substances as gasoline, acetone, ethyl ether, ethyl chloride, etc.

Zone 2: 100 to 500 ppm for such substances as carbon monoxide, methanol, toluol, methyl ethyl ketone.

Zone 3: 10 to 100 ppm for such substances as benzol, carbon tetrachloride, hydrogen sulfide.

Zone 4: 0.1 to 10 ppm for such substances as chlorine, hydrides, arsine, lethal war gases.

Zone 5: Less than 0.1 ppm for radio active gases.

Dr. Drinker explained that if a system of zones was set up, it would probably be much easier to allocate substances to zones rather than to set up an exact figure for a maximum allowable concentration. He believed that for practical engineering the use of these zones would be entirely satisfactory.

Mr. Cook stated that he had given some study to this idea and thought that in general it had many fine possibilities. It was particularly useful in explaining toxicity to people who were not too familiar with the subject of toxicity.

Dr. Schrenk believed that the fundamental idea had merit, but believed that it would require some study to determine just how many zones were needed and just what the limits of each zone should be in order to reduce, as far as possible, the borderline cases. In the general discussion which followed, it was suggested that it might be necessary to put carbon monoxide in a different zone. Dr. Hamilton suggested that it might be advantageous to divide Zone 2 into two groups on the thought that several substances might be tolerated at 200 ppm, but might be harmful at 400 or 500 ppm.

The chairman recalled the previous discussion at this meeting where it had been agreed that 100 ppm was acceptable for methyl chloride, but 200 or more ppm of this substance might prove harmful. Mr. Cook suggested that the idea of these zones probably should not replace maximum allowable concentrations which had been developed and approved, but might be very helpful on a large number of additional substances on which the committee did not believe that there was sufficient information to provide a definite concentration.

It was agreed that this subject should be given further study.

144. Plans for the Next Meeting. It was suggested that because of the need for work by this committee that plans should be made to hold meetings at such intervals as to promote the progress of this work. It was considered that probably two meetings a year would be profitable. In order to help the members to plan their schedules in advance, it was tentatively agreed that the next two meetings should be held on June 2 and December 1, 1948.

Adjournment. The meeting was adjourned at 3:45 p.m.

HENRY G. LAMB
Secretary

Reported by
F. Kwartler
P.H. Gruver

February 3, 1948

ASA
AMERICAN STANDARDS ASSOCIATION
70 East Forty-fifth Street, New York 17, N. Y.

29/33

PRIVATE COMMITTEE DOCUMENT
NOT FOR PUBLICATION

MINUTES

ASA SECTIONAL COMMITTEE ON SAFETY CODE FOR EXHAUST SYSTEMS, Z9

May 4, 1948

Subject to Confirmation)

The meeting was called to order by Mr. Theodore F. Hatch, chairman, at 10:00 a.m. in Room 2946, ASA offices, 70 East 45 Street, New York City

Present

Brandt, Allen D.	American Public Health Assn
Dorfan, M.I. (alt for W.O. Wedder)	Foundry Equipment Mfrs Assn
Greenburg, Leonard	Member-at-Large
Harris, W.B.	American Conference of Governmental Industrial Hygienists
Hatch, T.F. (Chairman)	American Industrial Hygiene Assn
Hoffman, E.E.	National Paint, Varnish & Lacquer Association
Katz, S.H.	U.S. Department of War
Stam, O.G.	International Acetylene Assn
Stern, Arthur C.	American Society of Mechanical Engineers
Stratton, Reuel C.	Assn of Casualty & Surety Cos
Wedder, W.O.	Foundry Equipment Mfrs Assn

ASA Staff
Hayes, D.F.
Lamb, H.G.

Absent

Anderson, D.G.	National Founders Association
Blake, R.P. (alternate)	International Association of Industrial Accident Boards and Commissions
Farrell, Arthur A.	International Association of Governmental Labor Officials
Kane, John M.	Dust Control Equipment Assn
Bureau of Ships rep	U.S. Department of Navy
Kelsay, Ray	U.S. Department of Labor
Martin, Alex	National Assn of Fan Mfrs
Massari, S.C.	American Foundrymen's Assn
Meigs, Ralph R.	National Assn of Mutual Casualty Cos

Absent (cont)

Miner, H.L.	Manufacturing Chemists' Assn of the United States
Monroe, R.W.	National Electrical Mfrs Assn
Schrenk, H.H.	Bureau of Mines
Seifert, Harry E.	U.S. Public Health Service
Silverman, Leslie	Member-at-Large
Witheridge, W.N.	National Safety Council
Rousseau, A.	Grinding Wheel Mfrs Assn

Approval of Minutes. Mr. Hayes reported that the minutes of the December 3, 1947 meeting had been circulated as Z9/29, and that no comments or corrections had been received. Upon motion duly made and seconded it was

VOTED

that the minutes of the meeting of December 3, 1947 (Z9/29) be approved as circulated.

Appointment of Secretary. Mr. Hayes informed the committee that at the last meeting no action had been taken in regard to the secretaryship of Z9. He suggested that he could assume the secretaryship, if the committee so desired and the sponsor, the International Association of Industrial Accident Boards and Commissions, indicated its assent. The committee agreed that this action should be taken.

Report of Subcommittee on "Fundamentals." Dr. Brandt, chairman of this subcommittee, reported that he had corresponded with his subcommittee and had received a fairly substantial number of comments directed to the revision of the "Fundamentals Relating to the Design and Operation of Exhaust Systems," on which this subcommittee was working. On being asked whether the work so far done by his subcommittee was available to the other members, Dr. Brandt agreed to write an imterim report, and send copies and comments to those who had asked for them. (Copy of the report is attached hereto.) He stated that it might be found necessary to rewrite the code, which could take till the end of the year.

Report of Subcommittee on Operations. The chairman stated that the subcommittee which had been set up at the time of the reorganization meeting of the sectional committee, with Mr. Stern as chairman, had reviewed the field of work involved and had presented a series of basic operations which was intended to provide the greatest possible coverage of operations throughout industry. He explained that Mr. Stern's subcommittee had attempted to categorize industrial substances into ten broad divisions with some subdivisions, with a view to arriving

at a reasonable program for the sectional committee. The chairman requested Mr. Stern to take over at this point.

Mr. Stern stated that he thought the report would speak for itself, and requested the committee's reactions to the headings which had been compiled. Discussion on the plausibility of setting priorities on the preparation of the items as they appeared in the subcommittee report followed. (Copy of this report is attached hereto.) It was pointed out that wherever there were existing standards pertaining to specifications written into the proposed standards, proper reference should be made to them.

During this discussion it was also pointed out that it would be most desirable to undertake those items on the list which could be accomplished within approximately a year's time. On motion by Dr. Greenburg seconded by Dr. Brandt it was unanimously

VOTED

that the report of Mr. Stern's subcommittee be accepted with the committee's thanks.

Upon further motion duly made and seconded it was unanimously

VOTED

that the chairman appoint a subcommittee to draft items 2 and 3 of the report, this subcommittee to handle both items; and

that this subcommittee be instructed to bring in a report within six months' time, at which time an effort would be made to have the completed assignments presented as proposed standards; and

that a separate subcommittee be appointed to do a similar job on item 4, also to report within six months.

The chairman stated that in his instructions to the subcommittees he would explain that the chairman of the subcommittee on items 2 and 3 was requested to set up two groups, each responsible for one part, but the subcommittee chairman being

responsible for their parallel structure. (At the request of the chairman, Mr. Stern accepted chairmanship of the subcommittee to develop standards for 'Surface Coating Operations' (item 2) and 'Open Tank Operations' (item 3); the chairman for the Subcommittee on Solid Materials Handling (item 4) will be named by Chairman Hatch.)

Report of Subcommittee on Scope and Plans. The chairman called upon Mr. Harris, chairman of this subcommittee, for a report which Mr. Harris read. Mr. Harris stated that his report was in two parts; the first on status of the work in other committees, and the second on recommendations as to plans and scope of the Z9 committee.

It was decided that this report should be circulated with the minutes, and, accordingly, copy is attached hereto.

General Discussion on Work of the Committee. The chairman stated that the ASA project on Safety Code for Exhaust Systems had had a long career during which there had been bursts of activity and inactivity. He suggested that the committee take the work seriously, and as its immediate objective assign and accept certain definite jobs with a view to some concrete results in as short a time as possible. He went on to say that it would probably be more effective to set limited objectives than to attempt to cover a wide field, and that the revision of the Fundamentals was one of these that it could hope to be accomplished.

After some discussion on the appropriateness of creating a small Executive Committee to coordinate the work being carried on on the various items, it was the general consensus of the meeting that this could be effectively done by the sectional committee itself.

The chairman then stated that he would like to raise the question of what the most important thing was that the Z9 committee was trying to accomplish. It seemed to him to be most important to develop in the fields of industry, designs and fundamentals analysis. He stated further that the cost of building and maintaining systems without the application of appropriate fundamentals was frequently costing industry many thousands of dollars. Mr. Vedder agreed, and stated that he believed there was need for educational work along these lines and too little was done by manufacturers of actual dust producing equipment. This Machinery was frequently purchases without any facilities for collecting dust, and often a local mechanic was hired to put the housing on the equipment.

During further discussion it was agreed that each member of the sectional committee had the responsibility of taking back to his group, standards produced by the Z9 committee, and promoting them within his own organization, and in addition an immediate concrete step was taken toward giving some further publicity to the problem. Mr. Vedder was asked to prepare a statement for use in INDUSTRIAL STANDARDIZATION; Mr. Hayes agreed to see that the article, when received, would be distributed to the appropriate trade magazines.

Coincidental with this phase of the discussion, the chairman requested Mr. Vedder to serve as chairman of a small subcommittee to study ways and means of further promoting familiarity in the industry with the "Fundamentals," in an attempt to reach those concerned, and to make clear to them that there were scientific fundamentals applicable to the design of exhaust systems. Organizations were then suggested as possible media through which this work could be carried on; among those suggested were the American Society of Heating and Ventilating Engineers, American Foundrymen's Association, the insurance companies, and other societies, such as the 'electroplaters' society.'

Dr. Greenburg questioned whether the word "Safety" in the title of the project was necessary, and wondered if it would be possible to have it omitted. Mr. Hayes agreed to make inquiries in regard to the question involved and omission of the word.

Plans for Next Meeting. It was agreed that six months from the date of this meeting would be a reasonable date on which the sectional committee could again meet to receive reports on the work.

D.F. Hayes
Secretary Z9

DFH:FH

June 5, 1948

REPORT OF SUBCOMMITTEE ON "FUNDAMENTALS"

This is an interim or progress report of the subcommittee appointed to review and revise 'Fundamentals Relating to the Design and Operation of Exhaust Systems'.

Following the meeting of the Sectional Committee in New York, December 3, 1947, at which time I was appointed chairman of a subcommittee to revise the existing document, I appointed as members of this subcommittee the following men: Leonard Greenburg, W.B. Harris, J.M. Kane, R.D. Madison, G.E. McElroy, B.F. Poftman, R.T. Pring, Leslie Silverman, and W.N. Witheridge. Copies of the existing publication, 'Fundamentals Relating to the Design and Operation of Exhaust Systems', along with a covering letter were sent to each of the members of the subcommittee with the request that they submit suggested revisions and changes to me so that I might summarize them for discussion at a meeting which was to be held shortly thereafter. All members of the subcommittee submitted suggested revisions and changes and these were summarized as shown on the attached hectograph copy of "Comments'.

A meeting of this subcommittee was scheduled for May 3, 1948, to consider the suggested revisions and changes. Unfortunately, only five of the members, including the undersigned, were able to attend this meeting. All comments submitted by the various members were considered, and it became apparent that the mission of this subcommittee was going to be one of rewriting and reorganizing to a large extent the existing code. To accomplish this, the contents of the existing document will be separated by sections and distributed to the various members of the subcommittee for rewriting.

(Signed) Allen D. Brandt,
Chairman

ADB:MAB

Z9/33
May 4, 1948

TO: Mr. Theodore Hatch, Chairman. ASA - Z9 Committee

FROM: Sub-committee on Industrial Operations

SUBJECT: Sub-committee Report

Your sub-committee held two meetings, on January 7th and March 17th, 1948 respectively, both at 80 Centre Street, New York, New York. The first meeting was attended by Messrs. Bradley, Hendricks, Postman and Stern; the second by Messrs. Bradley, Brush, Harris, Hendricks, Kane and Stern. At the first meeting Mr. Stern distributed a list of industrial operations to form the basis for discussion. In the interims between the two meetings Messrs. Bradley, Brush, Harris, Hendricks, Kane and Postman prepared and sent to all sub-committee members lists of industrial operations of their own devising, together with comments on these lists. Also in the interim between the two meetings a letter was received from Dr. A.G. Cranch declining appointment to this sub-committee and suggesting the appointment of Mr. Stam in his stead. This letter was received too late to include Mr. Stam in the March 17th meeting.

At the March 17th meeting, the list of industrial operations appended hereto was agreed upon and the following recommendations to the Z-9 committee adapted:

1. Exhaust system standards should be prepared for each of the industrial operations listed from #1 to #10 inclusive, on the appended list.

2. Priority of preparation should be given to operations listed from #1 through 4, inclusive on that list.

Respectfully submitted,

J.R. Bradley
H.F. Brush
W.B. Harris
H.V. Hendricks
J.M. Kane
B.F. Postman

Signed) Arthur C. Stern, Chairman
Sub-committee on Industrial Operations
Z9 Committee, ASA

LIST OF INDUSTRIAL OPERATIONS FOR WHICH EXHAUST SYSTEM STANDARDS SHOULD BE PREPARED

1. Mechanical Cutting and Abrading Operations

Definition: Mechanical cutting and abrading operations mean all operations involving cutting, machining, sanding, grinding, polishing, buffing, snagging, sawing or other similar operations on wood, plastics, rubber, metal or other solid materials, but not including abrasive blasting or rock cutting as defined below.

1 (a). Abrasive Blasting Operations

Definition: Abrasive blasting operations mean the process of blasting metal or other materials by means of abrasive or metallic particles for the purpose of removing sand, rust, scale or paint, to produce certain finishes, or change the physical characteristics of the material.

1 (b). Rock Cutting Operations

Definition: Rock cutting operations mean drilling, sawing, chipping, channelling, broaching or crushing to excavate rock in place in the earth by means of machinery or hand hammers.

2. Surface Coating Operations

Definition: Surface coating operations mean all operations involving the application of protective, decorative, adhesive or strengthening coating or impregnation to one or more surfaces or into the interstices of any object or material by means of spraying, spreading, flowing, brushing, roll coating, pouring, cementing or similar means; and any subsequent draining or drying operations, but not including open tank operations.

3. Open Tank Operations

Definition: Open tank operations mean all operations involving the immersion in liquids or in the vapors of such liquids of materials for the purpose of cleaning or altering the surface or adding to or imparting a finish thereto or changing the character of the materials, and their subsequent removal from the liquid or vapor, draining and drying. These operations include washing, plating, anodizing, pickling, quenching, dyeing, tanning, dressing, bleaching, degreasing, alkaline cleaning, stripping, rinsing, digesting and other similar processes, but not including molten materials operations.

4. Solid Materials Handling Operations

Definition: Solid materials handling operations mean all operations involving crushing, screening, charging, mixing, conveying, dumping, loading, drying, tumbling, milling, feeding, filling, packaging, discharging, opening, weighing, storing and similar handling of solid materials other than fibres capable of producing an airborne dust when so handled.

5. Fuel Burning - Exhaust Gas Producing Operations.

Definition: Fuel Burning - Exhaust Gas Producing Operations mean all operations involving the dilution or disposal of exhaust gases resulting from the combustion of a fuel in industrial process equipment or in vehicles operating in any occupied enclosed space, but not including any stationary fuel burning equipment used primarily for space heating or power, the exhaust gases of which are discharged to the atmosphere outside of the workroom through a chimney, stack or flue.

6. Molten Materials Handling Operations.

Definition: Molten materials handling operations mean all operations other than welding, burning and soldering operations, involving the use, melting, smelting or pouring of metals, alloys, salts or other similar substances in the molten state. These operations shall include heat treating baths, descaling baths, die casting, stereotyping, type casting, sand casting, permanent mold casting and similar operations.

7. Welding, Burning and Soldering Operations.

Definition: Welding, burning and soldering operations mean all operations involving the use of a flame, an electric arc, a heated utensil or device, or heat generated within the materials being processed, for the purpose of joining, severing, piercing or cleaning one or more pieces of said materials or for altering the physical characteristics of the material, but not including molten materials handling operations.

8. Fibre Handling Operations

Definition: Fibre handling operations mean all operations involving the handling, processing, spinning or weaving of cotton, wool, fur, asbestos, or other organic or inorganic materials constituted of threadlike or fibrous elements.

9. Volatile and Gaseous Material Handling Operations.

Definition: Volatile and gaseous material handling operations mean all operations, other than open tank and surface coating operations, involving the use or handling of volatile or gaseous materials in other than chemical process operations. These operations include spotting, cleaning, mixing and similar operations.

10. Chemical Process Operations.

Definition: Chemical process operations mean all operations other than solid materials handling operations, associated with the manufacture of specific chemical substances, such as reacting, filtering, centrifuging, distilling and other similar operations.

REPORT TO SECTIONAL COMMITTEE CHAIRMAN, SUBCOMMITTEE ON PLANS AND SCOPE

At the formation of the Subcommittee on Plans and Scope, a dual function was delegated to the committee. In accordance with this dual function, the report is broken down into two main headings. The first will outline, as briefly as possible, the present status of other committees on industrial ventilation which have been set up in outside organizations. The second section is the considerations of the Subcommittee on the scope of the Sectional Committee, with recommendations for future planning.

I. Status of other committees.

A. Committee on Industrial Ventilation, American Public Health Association. - This committee is still in an indeterminate stage, awaiting action by other similar committees. The chairman of the committee to date does not know what, if any, function this committee can or should serve. He feels tentatively that this committee should be dissolved, but at the same time is of the opinion that if such a recommendation is made to his parent organization, that he will be relieved of chairmanship and some one of other view would be appointed to carry on. Because of this attitude, the committee remains in a state of suspended animation.

B. Technical Advisory Committee on Industrial Ventilation to the Research Committee of the American Society of Heating and Ventilating Engineers. - This committee is still in a formative stage. It has been designated to bring before the members of the American Society of Heating and Ventilating Engineers the latest information on those problems within its scope, and to recommend to the Research Committee necessary research in the field. Also, to advise the Guide Publications Committee on revisions of the Guide. The scope has been defined as follows: To obtain, correlate and develop for A.S.H.V.E. members and particularly for those associated with industry, reliable, useful, and practicable information on the control by ventilation of industrial atmospheres to meet the requirements of health, comfort, safety, production, materials recovery, and atmospheric waste disposal, with the term ventilation to include the processes of supplying or removing air to or from any industrial space or operations, such change of air being either natural or mechanical, and the air may be conditioned. Subcommittees have been set up within the committee on the following subjects:

1. Subcommittee on dust collectors (to prepare a complete text)

2. Subcommittee to rewrite chapter 46 (industrial exhausts) of the guide.

3. Subcommittee to formulate research on oibliographic material.

4. Subcommittee to designate further fields of action.

All subcommittee reports expected by June 20.

C. Committee on Industrial Ventilation, American Conference of Industrial Hygienists. - This committee has to date accomplished nothing. The chairman of the committee for the past year proposed the deactivation of the committee and that the American Conference take the lead in proposing a strategy board composed of policy level people from all interested groups to allocate function to each group for the prevention of overlapping and duplication. The report of this committee was turned down on the basis that other groups have held the function for many years and to date have sufficient importance to their members to warrant immediate action. The feeling within the organization was that the American Conference can more quickly secure the information they feel essential if their committee puts in the necessary work to turn it out. Although they admit the value of outside representation, they prefer to publish unpolished material and let other organizations shoot holes in it. The first job which they intend to tackle is a "Good Practice Manual".

II Scope and Plans

A. Limitations. The formation of this sectional committee in ASA is felt to limit its function to the review, compilation and acceptance as standard existing data on design operation and maintenance of local exhaust systems and all components thereof.

B. Scope.

1. Data to be included.
   a. Nomenclature
   b. Definitions
   c. Specifications
   d. Design procedures
   e. Test procedures
   f. Maintenance schedules
   g. Design calculation figures for components
   h. Design fundamentals
   i. Air quantity and velocity data to satisfy control requirements.

2. System components to be covered.
   a. Exhaust hoods
   b. Piping and elements
   c. Fans and blowers
   d. Collection equipment
   e. Entire system

C: 1. Revise, rewrite and expand Z9

2. Prepare and add da ta to supplement Z9 covering individual processes as this material becomes available. This is to be accomplished by direct subcommittee assignment, according to functions laid down either by the sectional committee or the subcommittee on plans and scope.

(signed) W.B. Harris

A. Eisenbud, US AEC

B. Warren, Buffalo Forge, Buffalo, N.Y.

L. Morse, Chief, Div of Ind Hygiene, Chicago, Illinois

ASA
AMERICAN STANDARDS ASSOCIATION
INCORPORATED
70 East Forty-fifth Street, New York 17, N. Y

Z37/239
NOT FOR PUBLICATION

MINUTES

EXECUTIVE COMMITTEE

ASA COMMITTEE ON MAXIMUM ALLOWABLE CONCENTRATIONS OF TOXIC DUSTS AND GASES, Z37

May 11, 1949
(Subject to Confirmation)

The meeting was called to order by the chairman at 10:15 a.m., in Room 2946 of the Grand Central Terminal Building, 70 East 45th Street, New York 17, N.Y.

Present

Yant, W.P., Chairman
Bloomfield, J.J.
Drinker, Philip
Greenburg, Leonard
Kehoe, R.A.
McCord, Carey P.
Schrenk, H.H.
Selby, C.D.
Stratton, R.C.

The chairman recalled that this Executive Committee had been appointed as the result of the action taken at the December 9, 1947 meeting of the full Z37 Committee, to expedite the work of the Z37 Committee between full committee meetings. This committee was empowered to handle minor details, but did not have the responsibility or authority to adopt or reject standards.

Review of Work in Progress

1. Styrene Monomer. The chairman recalled that in accordance with the vote taken at the December 9, 1947 meeting of the full committee, the American War Standard on Styrene Monomer had been submitted to letter ballot of the full committee, with the recommendation that it be reapproved as a regular American Standard. The talley of that ballot had indicated that 5 members of the committee had cast negative votes, 3 had asked to be recorded as "not voting" and 1 ballot had not been returned. At the suggestion of the chairman, the secretary read the reasons given for the negative votes and the "not voting" ballots. The objections had been based on the belief that either the MAC had been set too high, or that there was a lack of clinical data to indicate the safe limits of styrene. Dr. Neal, in casting his negative vote, had suggested that this standard should remain as a temporary standard until more detailed information was available on the subject.

The chairman belived there were two courses of action open -- one was to follow the recommendation of Dr. Neal that this standard should be carried as a temporary standard until more conclusive data was available; the other, to reopen the case with the thought that since there had been no consensus on 400 ppm, perhaps the committee might agree on a lower concentration. Dr. Kehoe believed that since no additional information of a clinical nature had been made available to assist this committee in arriving at a decision, for practical reasons it might be desirable to issue this as a temporary standard. In the discussion which followed, it was indicated that no conclusive information was available that a lower concentration was desirable; it was further believed that in cases where no scientific data was available to indicate safe limits, it was far more desirable to issue a tentative standard, giving the latest and best information available on the subject, which would at least be a benchmark to aid those who were using the substance, rather than fail to issue a standard because of lack of complete information.

Upon motion duly made and seconded, it was

VOTED

that the American War Standard on styrene monomer be submitted to letter ballot of the full Z37 committee, with the recommendation from the Executive Committee that it be approved as a tentative standard, the ballot to be prefaced with the reasons for this recommendation.

2. Arsenic. The chairman recalled that it had been voted at the last meeting to withdraw this war standard, and this had been done. It had also been agreed that a subcommittee should be appointed to see if there was a need for a standard on arsenic, and if so, to prepare a draft. The chairman advised that he would appoint such a subcommittee.

Mr. Drinker asked if AsH_3 would be given consideration by this subcommittee. The chairman recalled that the war standard had not included AsH_3 and doubted if it would regularly come up under the considerations of the subcommittee. He questioned if this substance was used enough to warrant the establishment of a standard. Mr. Drinker stated that this substance was of importance to metal refiners. It was his opinion that AsH_3 was of greater industrial concern than As_2O_3. Dr. Schrenk remarked that probably the maximum allowable concentration of AsH_3 should be 0. Mr. Drinker was of the opinion that certain electrolithic refineries were encountering concentrations of AsH_3 considerably above 0.05 ppm. He believed that standards for both AsH_3 and As_2O_3 should be made available. He reported that chronic arsene poisoning had been alleged but not at a concentration of 0.05 ppm.

3. Carbon Tetrachloride. The chairman recalled that at the last meeting it had been reported that insufficient information was available to prepare a standard on this substance, and that Dr. Irish had been carrying on extensive experimental work and it was deemed advisable to await his findings.

He had spoken to Dr. Irish recently and had been advised that the work had now been completed and the conclusions would shortly be made available. Dr. Irish had indicated that it would be rather difficult to make any one specific standard that would cover the complete picture. The chairman believed that one of the difficulties of the carbon tetrachloride subcommittee had been that they were trying to specify a standard based on homogeneous data whereas the use of this substance resulted in hetrogeneous situations. The stalemate on this substance had been between Mr. Bowditch's belief that 50 ppm should be the limit, and Mr. Low's contention that 100 ppm was safe. There had been a special meeting on the subject to try to reconcile these differences, and a compromise of 75 ppm had been suggested, without any result. Dr. Drinker believed this stalemate would be irreconcilable as long as the scientific approach was used, rather than the common sense one. Dr. Kehoe believed that a double standard was necessary -- one for comfort and one for disease.

In the discussion which followed, it was pointed out that it was very important that this committee set a MAC on carbon tetrachloride, since it was a substance widely used and affected so many people. It was agreed that this subcommittee should be reactivated, and presented with the facts available, and urged to prepare a standard.

4. Welding Fumes. The chairman recalled that Dr. Drinker had been appointed chairman of a subcommittee to prepare a draft on welding fumes. At the time it had been thought that, as the result of a study on the subject which was being prepared by the U.S. Public Health Service, information might be available to prepare such a standard. Dr. Drinker reported that it would be impractical to prepare a standard on the composite welding fumes, but instead it would be necessary to prepare standards on the various components of the welding fumes. Actually, dependent upon the materials being welded, the fumes would differ. If structural steel was being welded with uncoated rods, one concentration of composite fumes might be acceptable, whereas in another situation where coated rods were used or where welding was being done on special steels or the substance had been plated or coated, a much lower concentration might be harmful. If the Z37 Committee were to develop a single value for the composite welding fumes, there would be a tendency for users to use this single figure without giving proper consideration to changes which might be made in the coating of the rods or other factors which would materially affect the hazard.

After further discussion, it was agreed that Dr. Drinker would prepare a statement to indicate what the individual components of welding fumes might do. This statement would be submitted to the full committee for approval, after which it would be available for use by all concerned with this subject. The secretary was requested to send Dr. Drinker a resume of the discussion at this meeting to help him in preparing this statement.

5. Fluorine and Fluorides. The chairman recalled that at the last meeting it had been reported that good work was going on but no results had been available to prepare a standard on fluorine and fluorides. Dr. Kehoe remarked that there was nothing new to report on this subject. The chairman commented that at his own suggestion Dr. Frary was being replaced on the subcommittee by Dr. Dudley Irwin.

6. Nitroparaffins. Dr. Kehoe, as chairman of the subcommittee, reported that pressure of business had prevented work on this subject. He felt that standards could be drawn up on certain ones, while others should be kept until more thorough investigations could be made. Nitromethane could be done rather promptly, and he believed that a draft on this could be available in a month or so.

7. Cyclohexane, Cyclohexanol, Cyclohexanone. Dr. Kehoe, as chairman of the subcommittee reported that there had been animal experimentation on these substances, but not otherwise, and he therefore believed that it was not possible to set a final standard under the circumstances. Dr. Greenburg believed the Z37 Committee was open to criticism when they failed to set standards for substances, for which complete experimentation had not been made. He believed that if they came out with tentative standards and indicated that they were based on animal experimentation only and that this was the best information available at the moment, while such standards might be open to criticism, they would still be helpful and everybody would be in a better position. The chairman believed that the drafting subcommittee should be free to write in such limitations to standards and such discussion as was considered advisable. He also believed that they were not fulfilling their obligation unless they adopted some procedure to make available for use the data that was available. He recalled that other groups issued tentative standards, which might remain tentative for five or ten years, during which time they were used and records kept of the problems and shortcomings involved, until such time as sufficient information was available to prepare permanent standards on the subject.

Mr. Stratton suggested that the real value of a tentative standard would come from a statement in the standard which would indicate what information and types of research had been available on which to base the tentative standard. Dr. Kehoe believed that this committee should prepare tentative standards in such instances where complete information was not available, but that these standards should clearly indicate in the first sentence that it was a tentative standard so that anyone wishing to use it could realize that it was merely a suggestion of what was feasible. Mr. Bloomfield agreed that this would be sound procedure.

Dr. Kehoe stated that he would go over these substances with Mr. Crillon and would prepare a wording on any of these related substances where sufficient information was now available. It was agreed that these statements, prepared by Dr. Kehoe, would be circulated for comment and criticism to the Z37 Committee.

8. Radium and Radon Gas. The chairman recalled that at the last meeting Dr. Greenburg had been authorized to expand his subcommittee to include Dr. Karl Morgan, Dr. James H. Sterner, and Dr. Bale. Dr. Greenburg reported that a final draft on this subject was in preparation and would be ready in a month or so. He agreed to send this draft to the secretary so that it might be circulated to the full Z37 Committee for study before the next meeting.

9. Silica. Dr. Greenburg suggested that Dr. Lanza, as chairman of the subcommittee on Silica, was probably ready to submit a statement to the Z37 Committee. The chairman agreed to ask Dr. Lanza for his report.

10. Cadmium. The secretary recalled that at the last meeting of the Z37 Committee it had been agreed that cadmium should be withdrawn as a war standard and published as a tentative standard, but no official action had yet been taken, pending a decision of how tentative standards would be handled. As soon as this had been settled, the secretary would initiate the necessary actions.

New Subcommittees

11. Chlorine. Mr. Stratton, as chairman of the subcommittee, reported that a draft had been prepared and was being sent to the members of the subcommittee. He believed this would be available for circulation to the full committee in about 2 weeks.

12. Sulphur Dioxide. Because of the present interest in concentrations of sulphur dioxide, particularly in view of the deaths in Donora, Pennsylvania, from smog, it was agreed that the chairman would appoint a subcommittee to study this substance. It was suggested that Drs. Machle, Schrenk and Kehoe might have an interest in this subcommittee.

13. Scope. The chairman recalled that the editorial committee had been asked to prepare a statement to expand the scope of the Z37 Committee. This request had come about, due to a request from the Textile Safety Code, LI, for information on humidity, dust and temperature. Dr. McCord had also suggested that there might be a future need for maximum concentrations of ultra-sonic vibrations. Dr. Schrenk reported that he and Dr. Neal as the editorial committee had corresponded on the wording of an expanded scope and they had agreed to the following: "ASA Committee on standards for the prevention and control of atmospheric conditions in industry, which adversely affected the health or well being of employees.

It was suggested that the scope might state that this committee was concerned with concentration limits of chemical and physical agents. Dr. McCord suggested that in Dr. Schrenk's statement the word "atmosphere" should be replaced by "environment". Dr. Kehoe believed that if the scope was to be markedly expanded, then the personnel of the committee would have to be reviewed and many additional members would have to be added, in order to provide technical competence on the new items included in the scope. The chairman recalled that under the present scope the committee was dealing with a large number of compounds. The Z37 committee did not include all of the experts on each compound, but merely had established a subcommittee of technical experts on each substance as it was considered. Dr. Greenburg believed that this same general method of operation would still be applicable to the Z37 Committee, even with the expanded scope as contemplated.

In an attempt to incorporate the new ideas now being considered into the present scope, the secretary suggested the following wording for the scope: "To determine, establish and promote the allowable concentration limits of chemical, physical and biological agents; and other subjects related to the allowable concentration limits of such substances in the environment of working places from the viewpoint of the health and well being of the workmen." It was agreed that Dr. Schrenk would discuss this problem further with Dr. Neal in light of the discussion at this meeting and that he would prepare a statement for circulation to this Executive Committee for further study.

14. New Substances. Mr. Bloomfield, as chairman of the subcommittee on new substances, reported as follows:

REPORT OF THE SUBCOMMITTEE ON NEW SUBSTANCES
OF THE Z37 COMMITTEE, ASA

"Your Subcommittee was appointed at the last meeting of the main committee, which took place December 9, 1947. This committee has never held a meeting, but has conducted its work entirely through correspondence.

"On June 3, 1948, your chairman circularized the committee to obtain suggestions from the members as to what new substances might be recommended to the main committee for development of new standards. In this letter seven substances were listed as possibilities for consideration as standards. Your chairman received comments on his original letter from all but one member of the committee.

"As a result of this exchange of letters, the following substances are hereby presented as possible material for the development of standards:

Sulphur dioxide	Diisobutyl ketone	Methyl bromide
Selenium	Methyl isobutyl ketone	Pentachlorophenol
Chlorine	Dichloromethane	Beryllium
Hydrogen cyanide	Ammonia	Sulphuric Acid

"Attached hereto is a list of threshold values adopted by the American Conference of Governmental Industrial Hygienists in 1948.* These same values were adopted in 1949. However the Committee of the Conference has suggested a value of 0.2 milligram per cubic meter of air for ortho-dinitrocresol on the basis of plant experience with this substance. It has also suggested a list of 12 substances for which no threshold limit value has been established. Among these is ketone. One of the members of our subcommittee has indicated that ketone need not be considered at this time since it is used in only one plant and is not an item in general commercial channels. The Conference Committee also prepared a list of 20 substances for which lower threshold limit values have been suggested by various Conference members. A copy of this material from the Conference is also attached hereto.**

* Appendix A Attached
** Appendix B Attached

"In the course of correspondence among the Committee members, several other points were raised which it is believed should be given consideration at this meeting. One is the suggestion brought forth that instead of having fixed standards, we give consideration to having zones or ranges of toxic limits in which certain substances would fall. You will recall that recently Drinker and Cook published a paper in which this suggestion was discussed. Another thought thrown out by several members of our subcommittee deals with the possibility of developing standard practices rather than standards alone. For example, the procedures in patch testing of the skin represent a great need for some industrial hygienists. No two persons are likely to follow the same steps as to the time, location, quantity, readings, and so forth in connection with patch testing. In other words, what is a standard patch test?

"And, finally, we have the question of necessity to review our present lead standard so as to provide for less stringent limits for such lead compounds as galena. One of the members of our subcommittee carried on a rather extensive correspondence on this topic and received almost as many divergent suggestions as there are lead compounds. Copies of this correspondence are also attached to this report."*

The chairman asked Mr. Bloomfield if the American Conference of Governmental Industrial Hygienists could supply the Z37 Committee with information as to what basis they had used in arriving at their present standards. Mr. Bloomfield agreed that this could be done. He further recommended that it might be to the best interest of all concerned, if the Z37 Committee determined the extent of use of some of these various substances before too much time was spent in trying to develop a maximum allowable concentration for that substance.

The chairman recalled that there had been some instances where the ACGIH had set lower MACs than those established by the Z37 Committee. He believed that this was undesirable and asked if it would be possible to obtain from the ACGIH the reasons why these values had been lower. Dr. Schrenk reported that he had now been made chairman of this subcommittee in place of Dr. Fairhall, and he agreed to look into the records of the ACGIH to see if he could obtain this information.

It was agreed that Mr. Bloomfield would give further study to his report and make an effort to indicate which of these new substances were most important and therefore should be given first attention at the next meeting of the Z37 Committee.

15. Zones. It was recalled that Messrs. Drinker and Cook had recently published an article concerning zones of concentrations with the thought that some people were now getting the concept that maximum allowable concentration figures for each individual substance were exact figures, whereas the members setting these figures realized that these could not be exact figures and that in most instances the values set might include an error of 25 percent either way.

*Appendix C attached

Dr. Schrenk asked if it would be possible for the various state health departments to use the zone system as had recently been suggested by Mr. Drinker. Mr. Bloomfield believed this would be possible, though he was not willing to agree at the moment that the exact zones which had been suggested would be practical.

It was agreed that the Z37 Committee should give further study to this problem. Mr. Drinker asked what should be done to get started on this problem. Dr. Schrenk suggested that the list prepared by the ACGIH showed MAC values for a large number of substances, and that one way to get started would be to list all of these concentrations in numerical order and see if any particular zoning became self-evident.

The secretary recalled that a general study on preferred numbers had been made by the American Standards Association, and a copy of the standard on Preferred Numbers was given to Mr. Drinker. The chairman asked Mr. Drinker to give further study to this problem and suggested that he also confer with Dr. Schrenk, Dr. Keohoe and Mr. Cook in the hope that they would be able to make a definite recommendation to the Z37 Committee.

16. Name of Standards. It was recalled that some people, in using the standards of the Z37 Committee, were trying to use the MAC as an exact number. Whereas this was satisfactory for acute situations, it led to misunderstandings, particularly with the problem of chronic illness. Dr. Selby suggested that instead of calling these maximum allowable concentrations, they might be termed "Hygienic Standards for Workrooms." It was recalled that whereas some MACs had been set in order to prevent toxic effects, other standards were now being set in accordance with either sensitory effects or in order to define comfort zones, on the basis that higher concentrations would be so uncomfortable to the workmen that higher operating values would be impractical. It was suggested that in the future, it might be important in each standard to indicate in some way whether the standard had been set on the basis of toxic effect, or comfort, or what other basis. It was agreed that the members would give further study to this problem.

17. Work of the Z9 Committee. The secretary reported that the sectional committee on Exhaust Ventilation, Z9, had recently studied a draft of a proposed standard on Open Surface Tank Operations. This draft had been prepared on the fundamental basis that different degrees of ventilation would be provided, dependent upon the degree of hazards of the substance in question. The substances had been placed in three zones -- those with MAC values less than 100, those between 100 and 500 and those with a MAC value over 500 ppm. As an appendix to their standard, they had considered including a list of substances and showing a suggested maximum allowable concentration for these substances.

The Executive Committee agreed that a protest should be registered with the Safety Code Correlating Committee to the effect that the establishment of allowable concentrations of toxic dusts and gases was within the scope of the Z37 committee and that such a list should not be included in either a standard or appendix developed by the Z9 Committee without first receiving the approval of that list by the Z37 Committee.

18. Plans for the Next Meeting. It was agreed that there was a real need for a meeting of the full Z37 Committee. It was also agreed that this should be called for Wednesday, June 29 at 10 a.m.

The meeting was adjourned at 3:30 p.m., subject to call of the chair.

Henry G. Lamb

Henry G. Lamb, Secretary
Z37 Committee

HGL:FHG

Encl: Appendix A
" B
" C

6-1-49

APPENDIX A

THRESHOLD LIMIT VALUES ADOPTED AT APRIL, 1948, MEETING OF AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS IN BOSTON, MASSACHUSETTS

GASES AND VAPORS

SUBSTANCE	P.P.M.
Acetaldehyde	200
Acetic acid	10
Acetic anhydride	5
Acetone	500
Acrolein	0.5
Acrylonitrile	20
Ammonia	100
Amylacetate	200
Iso-Amyl Alcohol	100
Aniline	5
Arsine	0.05
Benzene (benzol)	35
Bromine	1
1,3-Butadiene	1,000
n-Butanol	50
2-Butanone	250
n-Butyl acetate	200
Butyl cellosolve	200
Carbon dioxide	5,000
Carbon disulfide	20
Carbon monoxide	100
Carbon tetrachloride	50
Cellosolve	200
Cellosolve acetate	100
Chlorine	1
2-Chlorobutadiene	25
Chloroform	100
1-Chloro-1-nitropropane	20
Cyclohexane	400
Cyclohexanol	100
Cyclohexanone	100
Cyclohexene	400
Cyclopropane (propane)	400
o-Dichlorobenzene	50
Dichlorodifluoromethane	1,000
1,1-Dichloroethane	100
1,2-Dichloroethane (ethylene dichloride)	75
1,2-Dichloroethylene	200
Dichloroethyl ether	15
Dichloromethane	500
Dichlorotetrafluoroethane	1,000
1,1-Dichloro-1-nitroethane	10
1,2-Dichloropropane (propylene dichloride)	75
Dichlorotetrafluoroethane	1,000
Dimethylaniline	5
Dimethylsulfate	1
Dioxane	100
Ethyl acetate	400
Ethyl alcohol	1,000
Ethyl benzene	200
Ethyl bromide	200
Ethyl chloride	1,000
Ethylene chlorohydrin	5
Ethylene oxide	100
Ethyl ether	400
Ethyl formate	100
Ethyl silicate	100
Formaldehyde	5
Gasolene	500
Heptane	500
Hexane	500
Hydrogen chloride	5
Hydrogen cyanide	10
Hydrogen fluoride	3
Hydrogen selenide	0.05
Hydrogen sulfide	20
Iodine	1
Isophorone	25
Mesityl oxide	50
Methanol	200
Methyl acetate	200
Methyl bromide	20
Methyl butanone	100
Methyl cellosolve	25
Methyl cellosolve acetate	25
Methyl chloride	100
Methylcyclohexane	500
Methylcyclohexanol	100
Methylcyclohexanone	100
Methyl formate	100
Methyl iso-butyl ketone	100
Monochlorobenzene	75
Monofluorotrichloromethane	1,000
Mononitrotoluene	5
Naphtha (coal tar)	200
Naphtha (petroleum)	500
Nickel carbonyl	1
Nitrobenzene	1
Nitroethane	100
Nitrogen oxides (other than N_2O)	25
Nitroglycerin	0.5
Nitromethane	100
2-Nitropropane	50
Octane	500
Ozone	1
Pentane	1,000

APPENDIX A

SUBSTANCE	P.P.M.	SUBSTANCE	P.P.M.
Pentanone (methyl propanone)	200	Sulfur chloride	1
Phosgene	1	Sulfur dioxide	10
Phosphine	0.05	1,1,2,2-Tetrachloroethane	5
Phosphorus trichloride	0.5	Tetrachloroethylene	100
iso-Propanol	400	Toluene	200
Propyl acetate	200	Toluidine	5
iso-Propyl ether	500	Trichloroethylene	100
Stibine	0.1	Turpentine	100
Stoddard solvent	500	Vinyl chloride	500
Styrene monomer	200	Xylene	200

TOXIC DUSTS, FUMES AND MISTS

SUBSTANCE	Mg. per cum m.	SUBSTANCE	Mg. per cum m.
Antimony	0.5	Mercury	0.1
Arsenic	0.5	Pentachloronaphthalene	0.5
Barium	0.5	Pentachlorophenol	0.5
Cadmium	0.1	Phosphorus (yellow)	0.1
Chlorodiphenyl	1	Phosphorus pentachloride	1
Chromic acid and chromates as CrO_3	0.1	Phosphorus pentasulfide	1
Cyanide as CN	5	Selenium, as Se	0.1
Dinitrotoluene	1.5	Sulfuric acid	1.0
Fluoride	2.5	Tellurium	0.1
Iron oxide fume	15	Tetryl	1.5
Lead	0.15	Trichloronaphthalene	5
Magnesium oxide fume	15	Trinitrotoluene	1.5
Manganese	6.	Zinc oxide fume	15

MINERAL DUSTS

SUBSTANCE	M.P.P.C.F.	SUBSTANCE	M.P.P.C.F.
Alumdum	50	Silica:	
Asbestos	5	high (above 50% free SiO_2)	5
Carborundum	50	medium (5 to 50% free SiO_2)	20
Dust (nuisance, no free silica)	50	low (below 5% free SiO_2)	50
Mica (below 5% free silica)	50	Slate (below 5% free SiO_2)	50
Portland cement	50	Soapstone (below 5% free SiO_2)	20
Talc	20	Total dust (below 5% free SiO_2)	50

RADIATIONS

MATERIAL OR RADIATION	Radiant Energy	MATERIAL OR RADIATION	Radiant Energy
Gamma (roentgen per day)	0.1	Thoron (curies per cubic meter)	10^{-8}
Radon (curies per cubic meter)	10^{-8}	X-ray (roentgen per day)	0.1

APPENDIX B

I

NEW THRESHOLD LIMIT VALUE

Ortho-dinitro-cresol

A value for ortho-dinitro-cresol of 0.2 milligram per cubic meter of air has been suggested on the basis of plant experience with this substance.

II

PROPOSED NEW SUBSTANCES FOR WHICH NO THRESHOLD LIMIT VALUE HAS BEEN ESTABLISHED

Asphalt fumes and dust
Beryllium
DDD
DDT
Ethylene glycol
Diethylene glycol
Dipropylene glycol
Ketene
Monochloromonobromomethane
Pentachlorophenol
Propylene glycol
Triethylene glycol

III

SUBSTANCES FOR WHICH LOWER THRESHOLD LIMIT VALUES HAVE BEEN SUGGESTED BY THE CONFERENCE MEMBERS

Acetic acid
Acrolein
Alcohol, amyl
Alcohol, isoamyl
Ammonia
Benzene
Bromine
Carbon monoxide
Carbon Tetrachloride
Hexavalent chromium
Hydrochloric acid
Naphtha (petroleum)
Nuisance dust
Ozone
Radiation, gamma
Radiation, X-ray
Silica
Stoddard solvent
Sulfuric acid
Trichloroethylene

Appendix C

A.S.A. Z-37, COMMITTEE ON NEW SUBSTANCES

Manfred Bowditch to J.J. Bloomfield, June 8, 1948

Lead is certainly not a "new substance" and it may well be that my thoughts on this subject are not appropriate for your special committee's consideration. I think, however, that a start should be made towards substituting separate standards on some of the more common and toxicologically widely differing lead compounds for the present blanket standard of 1.5 mgm. per 10 cubic meters. You may perhaps wish to discuss this with Lawrence Fairhall and let me know how you think the subject might best be broached to the full committee.

Another item in which I am interested is the possibility of setting up some sort of standards for stippled cell counting methods. I have discussed this casually with Bill Machle, but nothing more. Is this in your opinion a suitable subject for the Z-37 committee's consideration?

COMMENTS ON THE ABOVE

A.G. Cranch

Yours of June 11 received with excerpts from your letter of June 8 to J.J. Bloomfield. . Am heartily in accord with the ideas you express in that letter. Certainly I think there is enough difference in hazard in various forms in which lead is used industrially so that it would be very well to consider the advisability of separate standards for some of the more commonly used forms. Would be glad to see such a discussion brought up at the ASA Z-37 meeting.

The second point you bring up is also quite pertinent as I have noted that in different locations the doctors use quite different standards in the interpretation of stippled cell counts to say nothing of variations in technique. Whether this particular point is one which is a suitable subject for discussion by Z-37 I am not prepared to say. It seems to me that the scope of this committee might be too limited to bring in a discussion of a standard for diagnosis based on blood examination. It is concerned more with the limits of contaminants in the atmosphere and methods of their determination than with diagnostic procedures. Perhaps this subject can be better approached through some other agency.

Philip Drinker

Thank you for the two paragraphs from your recent note to Bloomfield. We have a study on now at St. Joseph Lead's plant at Bonne Terre which will, I hope, show what the St. Joseph Lead men and I believe very strongly and that is that the toxicity of lead sulphide as galena is inconsequential compared with that when galena is roasted. I am sure Felix Wormser feels just as strongly as I do on this point. Therefore, I think your suggestion is timely.

L.T. Fairhall

Jack Bloomfield and I have discussed the matter of variation in toxicity of the different lead compounds and the present blanket standard for lead of 1.5 milligram per ten cubic meters of air.

You may recall that Jack and his associates set up this standard originally (PHS Bull. No. 205) and it was based upon exposure to the oxides of lead and lead fume. Since then it has been widely, if not universally, accepted as a basic standard of lead. I realize that the toxicity of lead compounds varies tremendously from lead tetraethyl to galena. Lead compounds such as lead phosphate, galena and lead silicate, or lead frit are now recognized as far more insoluble in tissue fluid and therefore more inert than the lead oxides and carbonate or even the sulphate (PHS Bull. No. 253). However, Kehoe does not consider that there is this variation in lead compounds. Even with such a toxic substance as lead tetraethyl he states (Tetraethyl Lead Poisoning. J.A.M.A. 85: 108, 1925) that "Nevertheless, it cannot be doubted that the lead is the essential toxic agent in the compound (lead tetraethyl). In fact, its toxicity is of the same order of magnitude as that of other well known compounds of lead." (Italics mine.) He also states (J. Lab. Clin. Med. 6: 554, 1927) "on the toxicity of tetraethyl lead and inorganic lead salts, its (lead tetraethyl) toxicity varies little from that of other and water soluble lead compounds. This fact indicates that its toxicity is a function of the lead and not of any peculiar qualities characteristic of the compound."

I quote these extraordinary opinions because you may find some opposition to the fact that lead compounds do vary in toxicity. However, and quite apart from the above, I feel that to use different MAC's for lead or its compounds would lead to much confusion. I have never felt that there was any disagreement by the Lead Industries Association with the basic MAC value for lead. Where galena or lead frit are involved I would a) either exempt these from a MAC value altogether, or b) leave the matter to the common sense of the industrial hygienist.

With regard to the standards for stippled cell counting methods, I would suggest you get in touch with Elston Belknap of Milwaukee, Wisconsin, who has done outstanding work in this field for twenty years or more.

W.J. McConnell

In reply to the extract of your letter to Jack Bloomfield regarding separate standards for widely differing lead compounds, I fully appreciate your feelings with respect to the inconsistency of using a blanket standard for lead compounds of varying toxicities.

On the other hand, there are so many physiological factors which may cause variations in human toxic thresholds, not to mention factors which may cause variations in environmental concentrations of the materials, that I question whether we should place too much dependence on the security offered by so-called safe standards. It seems to me that such standards can only be very roughly approximated. Therefore, the present standard which has been accepted might well suffice for all compounds of lead. I doubt whether more precise standards could be approximated.

With respect to standards for stippled cell counting methods, I believe Dr. Hamilton has suggested certain standards. Here again, I don't think that laboratory tests can be substituted for intelligent observation and evaluation of the worker as an individual by an informed physician. I don't think that blood examinations should be confined to stippling alone, but a red and white cell count, a notation of changes in color or morphology of the red cells, and any drop in hemoglobin should be included. Variations from normal lead content in the urine should also be made. These laboratory data, together with the clinical symptoms and signs, must all be evaluated in arriving at a diagnosis and I would hesitate to emphasize any group in particular.

C.P. McCord, June 16

In your letter of June 11 you ask me to comment on an excerpt of a letter to Mr. Bloomfield.

For a long while some of us have firmly felt that by no means are all lead compounds equally dangerous due to distinct differences in solubility rates. This was long discussed at an earlier time in ASA meetings. It was then agreed that substantial differences as to prospects of lead poisoning from different compounds existed but to the majority it seemed inexpedient to make any demarcations. It appears practical that the long list of ordinary lead compounds might be broken down into three zones, with the first conforming to the present standard of 1.5 mg., a second possibly leading to a 3 mg. level and the third, remotely possibly reaching as high as 6 mg. I realize that this last figure may be anathema to some, but the warrant may still exist for a few compounds. By no means do I commit myself to any such figures.

Long ago William Fredrick and I set up a number of lead zones somewhat in line with the above statements. I am suggesting that you write him for a copy of our listing. Bill is so given to stringent standards that any statement from him toward liberalization to the present situation would be almost the last word in needed changes.

As to your second point, that is standards for stippling, I am less enthusiastic. Stipple cells in the blood in lead poisoning or otherwise, partly may be regarded as accidents. By no means do they represent the total number of red cells containing basophilic material. The number of stipple cells formed in lead poisoning in my opinion is a frail index of the severity of lead poisoning or the imminence of its appearance. The artificial clumping of all basophilic material in red cells (basophillic aggregation test) is much superior but still should be regarded chiefly as a screening procedure. Regularly we make use of this procedure in group examinations of suspects and with highly helpful results. We would never rely upon this as a final criterion in diagnoses. It is my thought that you should neither press the item of stipple cell standardization nor place too much emphasis on its conclusive value in diagnoses. No less, positive results are quite helpful along with several other items such as quantitative lead determinations in urine, in an overall appraisal of the diagnostic situation.

C.P. McCord, June 24

There are two small objections to your including my recent letter in your compilation on tolerable lead exposure levels.

The first of these is that I do not want to appear to be working behind the back of the Z-37 committee.

The second is that the very high figure that I mentioned for a few lead compounds may not be regarded as an exact one and is not based on actual experience. While I do believe that the standards should not be uniform for all lead compounds and should be liberalized for many, I do not want to be credited as sponsoring any exact high figure at this time. If this present letter be included along with the earlier one for discussion purposes, I will have no objection to the use of both.

H.H. Schrenk

With reference to your question regarding the permissible limit of lead, I appreciate very definitely problems involved. There are a large variety of lead compounds and the permissible limits for individual ones could vary widely. It seems to me that this question might well be placed before Committee Z37 again as well as before the G.I.H. Committee. The question of stippled cells might also be placed before Z37 because I believe that most of the people who have worked with this procedure are members of the committee and therefore the committee would be in a position to discuss the subject intelligently.

Appendix C

June 28, 1948

Mr. Bloomfield
Dr. Cranch
Prof. Drinker
Dr. McConnell
Dr. McCord
Dr. Schrenk

A.S.A. Z-37, COMMITTEE ON NEW SUBSTANCE

The following are further comments on the subjects of my letter of June 30 received since that date. As I have not in all cases gone through the formality of asking permission to quote, the names of the writers are omitted and their contributions to the discussion stand on their own merits.

(Signed) Manfred Bowditch

July 2, 1948

"Personally, I believe that if different compounds of a given element vary greatly in the magnitude of their toxic effects, due consideration should be made in establishing M.A.C. values. As you know, we have had relatively no experience with lead sulfide here, but we have had a little with lead chromate and also some with lead frit. I believe that adequate studies for these substances should be made; and if the results warrant a conclusion that the order of toxicity is substantially lower than that of the more soluble forms of lead, higher M.A.C. values should be established for the compounds in question.

"Actually, I feel that the situation is not as serious with lead as with some of the other elements, since urine analyses are a pretty good index of the degree of the hazard in the case of this metal. On the other hand, with compounds of cadmium, beryllium, chromium and possibly manganese, this additional tool is of much less value. Other elements, such as arsenic, mercury, and fluorides also warrant consideration, but with these urine analyses are more useful.

"I do not feel, however, that we are at present in a position to establish the different M.A.C. values on the basis of purely chemical properties, such as solubility data. It would be desirable in each case to have at least two individual studies of a given substance made by different groups before considering any proposals for such changes.

"With regard to stippled (or stipple) cell counts, I cannot speak with much authority, but there does appear to be room for improvement in technique and interpretation of results."

July 2, 1948

"While I do not agree with all of Fairhall's reasoning I cannot disagree too much with his conclusions. I see very little point in leaning too heavily on statements made by Kehoe in 1925 and 1927. Quite a bit of lead has flowed out of the ladle since that time. I am willing to accept

as a major premise the fact that there are differences in the toxicity of various lead compounds. Until the mechanism of these differences is pretty clearly understood I would be reluctant to design arbitrary standards for the different ones. The simple criterion of solubility in body fluids is not, I think, conclusive evidence. It is perfectly possible that some of these materials differ in toxicity for reasons which have nothing to do with their solubility.

"In some instances a lead exposure involves only one single lead compound but it it certainly not uncommon to have two or more compounds involved. It might be possible to establish the three zones for various compounds as suggested by Carey McCord but I question the advisability of establishing separate MAC's on the basis of our present knowledge. After all, if a shop can be ventilated down to a 6 mg. level it is not too difficult to get the level on down to 1.5 mg. For this reason I feel that it might be advisable as Fairhall suggests to leave the matter more or less to the common sense of the industrial hygienist.

"Setting up separate standards would inject considerable confusion into the subject and you might be faced subsequently with the necessity of trying to change them, which as you know, is not an easy process.

"I refuse to be drawn into the controversy on stippled cells. Even if you have a standard method of counting them it remains a poor criterion for evaluating exposure while instituting a survey for some more exact laboratory procedure."

July 5, 1948

"Of course I am with you on the importance of making a clear distinction between the allowable amount in the air of lead compounds of varying toxicity. There was some effort to do this when the standard was set by Committee Z37, making it cover only "metallic lead, lead carbonate, lead sulphate, lead oxides, lead nitrate and lead chloride." But it is hard to see how an atmosphere could become impregnated with metallic lead and a distinction should be made between the basic carbonate and the carbonate, between the basic sulphate and the sulphate. Both the basic compounds are more soluble in the body fluids than the straight compounds, so it would be unfair to impose the same standard on mines where the carbonate and sulphate occur and plants where Old Dutch Process white lead and "sublimed white and blue lead" are produced.

"As to the question of standardizing the stippled cell test, that is certainly desirable, but of course the method must then be standardized. Teleky did that, I think, in Germany. You might ask him. The method is very simple as I remember it, especially the way of rapid counting."

"Since I am constitutionally against standardization for its own sake, I am sympathetic to the question you raise as to adequacy of the present MAC for all forms of lead. Just as Fairhall says, the figure was determined statistically for lead oxide and has been applied to other forms including some which, perhaps, go too far. Moreover, there is growing evidence in certain industries indicating that higher levels may be tolerated without practical trouble. However, the present figure is so well known and the objective so good, that I would hesitate to suggest any changes without confirming quantitative evidence. So, instead of advocating changes in the MAC now, I would emphasize the need for such studies--by industry from actual experience and in the laboratory."

July 6, 1948

"First, there can be no doubt that the practical hazards of occupational lead exposure vary tremendously with the chemical composition and physical state of the compound or compounds suspended in the air breathed by workmen. I have never said or thought anything to the contrary. It is obvious that galena, suspended in the air in connection with mining operations, presents a quite different problem from that of the same concentration of metallic lead and/or lead oxide, distributed in the atmosphere of a smelter or foundry. One is substantially harmless. The other in the concentration of 1.5 mg. per 10 meters is dangerous for prolonged periods of exposure (in excess of one to two years). This is not wholly a question of solubility, but is in part a matter of state of subdivision and shape of particle. No doubt the solubility and chemical reactivity, (i.e. nature of the chemical compound,) are important factors of the practical hazard of lead compounds, but the physical factors also influence the matter tremendously.

"Second, when we speak of toxicity, we must be sure whereof we are speaking. Toxicity, in the toxicological laboratory, may have meanings utterly unrelated, or only indirectly related, to practical hazard. When I spoke (correctly) of the toxicity of tetraethyl lead, I was talking about the lethal properties of a material that was known to have been absorbed, and about the effects upon the functions of tissues incident to the presence therein of a known quantity of lead. I did not undertake to say what its final form or chemical combustion in the tissues might be. My purpose in the article cited was only to point out that when one administers lead chloride or lead acetate (dissolved in water) intravenously, the mortality among experimental animals corresponds to that which results from the intravenous injection of a corresponding quantity of lead as lead tetraethyl. I did not say, and in fact, did not discuss, in this relationship, the practical industrial hazards of tetraethyl lead. Toxicity, in relation to a cell or a collection of cells in the body, is one thing. The potential toxicity of a material outside the body, on the skin, in the alimentary tract or even in the respiratory tubes and air cells, is quite a different matter, since any evidence of toxicity depends upon the ability of the material to gain access to the tissues. From then on what happens will depend upon where it goes and how it is disposed of, but, if it does not get in, it exerts no practical threat. The general biologist knows this

and has long since pointed out that there is no necessary relationship between the toxicity of a substance for unicellular organisms, and that for complex forms of animal life.

"Third, there are very few sound clinical and experimental data, in relation to the various compounds and subdivisions of compounds represented individually or collectively in industrial environments, whereby we can set tolerances. I and my associates have the most precise and best correlated data available on this matter, I am sure, in relation to a number of situations, but with one exception, namely, that of exposure to tetraethyl lead, they are not qualitatively and quantitatively adequate for the purpose. We regard this problem as requiring extensive investigation, and we have planned a program of human experimentation along this line, comparable to our work on the ingestion of lead. Until this is done by ourselves and/or others on a comprehensive scale in the laboratory or in industry, tolerances cannot be set with much better background than now exists.

"Fourth, a standard not related to the environment, but to the extent of the lead absorption, could be set up with every assurance that it will stick indefinitely. This cannot be done in relation to stippling or to quantitative estimates of basophilic material in the blood, for these physiologic responses are not dependent primarily or solely upon lead absorption. There is no point whatever in adding confusion to the existing confusion by promoting reliance upon any such procedure. One will have to measure by appropriate specific analytical means the extent of the absorption of lead, as shown by the lead concentration in certain body fluids. When this is done, no important consideration need be given to the nature of the exposure or to the compound involved. Danger, or the lack of it, can be expressed adequately in these matters (i.e. basophilic material in the blood, and lead concentration in blood, urine, etc.) the data are available to prove my statements, and therefore no serious question of fact exists. Here we return to the problem of toxicity. There can be no very serious doubt that the extent of the risk of poisoning from lead which has actually been absorbed into the body, relates to the quantity absorbed and not to the nature of the compound to which the individual was exposed. (There may be an exception to this, but for the lower levels of prolonged absorption and accumulation in the body this statement can be accepted as valid with little or no doubt.) Thus, if we were to resort to such a standard, we could ignore all controversial and confusing matters related to the "toxicity", solubility, state of subdivision, of the several industrial lead compounds and devote our attention to the maintenance of safe conditions for the men.

"Finally, I do not believe it is either practical or necessary to undertake at this time to set standards with respect to maximum allowable concentrations of various lead-containing industrial materials in the atmosphere of working establishments. Bloomfield's standard, a considerable improvement over that of Duckering (as promulgated by Legge), is largely a bench-mark--a reasonable approximation of the general situation. It relates to certain conditions and not to others. It is at once too high and too low.

But it serves a useful purpose among the initiated, and hurts the cause very little among the dogmatic and ignorant. Until we are in better position to substantiate other figures, we had better leave it alone. We do not need a new standard of this kind nearly so much as we need performance in line with the implications and the purposes of the present standard."

July 12, 1948

"With reference to the suggestion of substituting separate standards for lead compounds of differing toxicity, I am inclined to agree with Fairhall's and McConnell's comments. Although considerable clinical and engineering data support the M.A.C. of 1.5 mg. per 10 cubic meters of air in the instance of lead oxides and fumes, analogous data for the less toxic compounds is not as complete or convincing.

"Standardization of stippled cell counting technique offers a lot of room for debate. I'm not in position to give an opinion as to the suitability of the Z-37 Committee considering this problem. I would think, however, it might be tackled through some other agency. Perhaps a thorough appraisal of existing procedures plus some developmental research is necessary. Possibly a special study could be set up by hematologists or clinical pathologists."

July 13, 1948

"It is my feeling that there is wide variation in the toxicity of certain lead compounds and while I realize that we do not know too much about the various compounds and their degrees of toxicity, we can nevertheless, in my opinion, make a start by picking out two or three or four of the more widely divergent compounds from the point of view of toxicity and attempt to assign levels for them based on the known facts. I believe this subject should be explored at the earliest possible opportunity in order to delineate those parts of the field which may be segregated as to their toxic levels and in this way, really get down to the nub of the question. I do not delude myself into thinking that we can do a complete job but at least we can do a partial job with the important substances.

"With reference to stippled cell counts, I believe there is every reason for going forward into a standardization of the method, materials and technique for making stippled cell counts. A great deal of importance is attached to such counts by a great many of the men in the field and certainly, methods should be standardized at this time."

July 14, 1948

"I am in sympathy with the idea that the American Standards Association should take up the subject of stipple cell counts. The uniformity of procedure with standards to aim at for stipple cell evaluations would be a very real help. Many physicians would be glad of authentic help on this question. In Boston we have been troubled by a reputable commercial laboratory's announcement that its head physician will go into court and testify that one stipple cell makes a diagnosis of lead poisoning. Obviously this can lead to very serious trouble."

July 14, 1948

"I quite agree that one MAC will not cover all compounds and certainly those for galena and lead silicate should be revised upwards. To fail to do so in light of the evidence from the galena mines would be to ignore definitive evidence.

"As to Fairhall's comments on Kehoe's statement, the point at issue is the interpretation of the word "toxicity". From the practical point of view no one believes that all compounds are equally likely to produce poisoning."

July 16, 1948

"We are at the moment going over a paper which we have practically completed on our past experience with regard to development of lead intoxication and its relation to lead urine analyses. We are reporting on 406 cases of exposed workers whom we have observed over the last five or six years to more or less substantiate our opinion that present MAC's are too low. In this group 64 men or 16.3% developed lead intoxication and many of these maintained lead excretion rates in excess of 400 micrograms per liter for long periods before intoxication occurred, and there were many men outside of this group who had high excretion rates over long periods of time without ever developing intoxication."

July 19, 1948

"As to standards for stippling, it is my feeling that if such a situation could be accomplished, it should be of great value.

"I am not unmindful of the various opinions regarding the value of the stipple count, yet no one would dare to disregard its significance.

"I like the way McConnell answered this part of your inquiry."

July 23, 1948

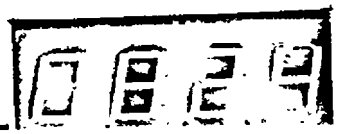
"I think that it is clear to most of us that maximum allowable concentration values will eventually have to be established on the basis of molecular configuration rather than the elemental state. This is already being practiced widely in respect to organic compounds, but for some strange reason has not been applied in any appreciable extent to those compounds containing basically inorganic elements such as lead, fluorine and arsenic. Certainly the toxicity of arsenic varies widely with compound formation and its toxicity in arsene is vastly different than its toxicity in mapharsen.

"Those of us who have done animal work on lead compounds know that here too there is a tremendous variation in toxicity depending upon the nature of the compound. In the inorganic series of compounds the variation can usually be referred in qualitative fashion to the solubility of the compound, the toxicity decreasing with the solubility.

"Practical field experience in controlling lead exposures has clearly demonstrated the difficulties associated with the use of maximum allowable concentrations based on atmospheric values alone. Many lead operations are intermittent in character and the establishment of weighted means of exposure is virtually impossible. Practical field experience has also clearly indicated that blood abnormalities cannot be used as criteria of excessive lead absorption since every blood test which I know of is likely to become negative in case of prolonged exposure to excessive levels of lead. On the other hand estimating absorption rate by urinary excretion values, particularly when applied to a group of workers, has proven to be very reliable and valuable. Although we continue to take the ordinary atmospheric samples around lead using operations, for the past four or five years we have usually based our exposure evaluation upon the urinary lead content. We are using the worker as a sample collecting device. Interpretation of urinary values is usually made on the average of a group of similarly exposed workers since there may be considerable variation among individuals from day to day even though the exposure level remains the same. Urinary excretion rate criteria automatically compensate for variations in solubility rates of the several lead compounds. I feel that a supplementary maximum allowable concentration value should be established based upon urinary excretion rate and fixed in the neighborhood of 0.15 mg. per liter value.

"You refer in your letter to a list of limit values for lead compounds which we set up here a number of years ago. These were a portion of a proposed regulation for the protection of workers exposed to lead and its compounds. It is quite detailed and extensive. This regulation has never been put into effect as written but it does incorporate the basic principle of recognizing differences in the action of lead compounds. The lead compounds were divided into three classes, 1, 2 and 3. The maximum allowable concentrations were 0.15, 0.3 and 0.45 mgs. per 1 M^3 respectively. Class 1 included such soluble compounds as lead acetate, lead nitrate, lead formate and lead tetraethyl. Class 2 included such compounds

as lead metal, the several oxides of lead, lead carbonate and lead chromate, Class 3 contained the very sparingly soluble compounds such as lead sulfide, lead silicate, lead titanate and lead tartrate. In the light of accumulated experience, I am inclined to believe that the limit value of .45 mg per 1 M3 for class 3 compounds is unnecessarily conservative."



ASA

AMERICAN STANDARDS ASSOCIATION

70 East Forty-fifth Street New York 17 N Y

CS 241
November 15, 1950

Personnel of ASA Sectional Committee

on

SAFETY CODE FOR EXHAUST SYSTEMS, Z9

Sponsors: American Industrial Hygiene Association
American Society of Heating and Ventilating Engineers
National Association of Fan Manufacturers

Scope: Standards for the design, operation and maintenance of equipment to provide a safe atmosphere by removing harmful substances from their point of production or issuance and by safely disposing of such substances; and such supplementary standards on personal protection as may be necessary to prescribe methods for the protection of workers.

Chairman: Theodore F. Hatch

Secretary:

Organization Represented	Name and Business Affiliation	Classification
American Conference of Governmental Industrial Hygienists	K.M. Morse, Chief Division of Industrial Hygiene Illinois Dept of Public Health 1800 West Fillmore Street Chicago 12, Illinois	D
American Foundrymen's Society	S.C. Massari, Technical Director American Foundrymen's Society 222 West Adams Street Chicago 6, Illinois	B
American Industrial Hygiene Association	Theodore F. Hatch University of Pittsburgh Graduate School of Public Health Pittsburgh 13, Pa.	I
(alternate)	Allen D. Brandt, Ind.Hyg.Engr. Medical Department Bethlehem Steel Corp. Bethlehem, Pa.	
American Public Health Association	Allen D. Brandt, Ind. Hyg. Engr. Medical Department Bethlehem Steel Corp. Bethlehem, Pa.	B

Organization Represented	Name and Business Affiliation	Classification
American Electroplaters' Society (Liaison)	E.R. Bowerman Sylvania Electric Products, Inc Physics Laboratory Box 6, Bayside, L.I., N.Y.	
(alternate)	M.B. Diggin Hansom-Van Winkle-Munning Co. Mattawan, New Jersey	
American Society of Heating and Ventilating Engineers	William M. Wallace II Consulting Engineer 126 East Parrish Street Durham, N.C.	B
(alternate)	H.E. Ziel Albert Kahn Associated Architects & Engineers, Inc. New Center Building Detroit 2, Michigan	
American Society of Mechanical Engineers	Arthur C. Stern Division of Industrial Hygiene N.Y. Department of Labor 80 Center Street New York, N.Y.	D
American Society of Safety Engineers	William F. Weber, Hazards Engr Western Electric Co. 100 Central Avenue Kearny, New Jersey	E
Association of Casualty and Surety Companies, Accident Prevention Department	Reuel C. Stratton, Supervising Chemical Engineer Engineering and Inspection Div. The Travelers Insurance Co Hartford 15, Conn.	F
Dust Control Equipment Association	John M. Kane American Air Filter Co. Inc. Louisville 8, KY.	A
(alternate)	S.S. Parsons, President Parsons Engineering Co. 2545 East 79 Street Cleveland, Ohio	

Organization Represented	Name and Business Affiliation	Classification
Federal Security Agency, Public Health Service	Charles D. Yaffe Acting Chief, Field Headquarters Division of Industrial Hygiene Federal Security Agency, Public Health Service 1014 Broadway Cincinnati 2, Ohio	D
(alternate)	Ronald E. Bales (Division and Address as above)	
Foundry Equipment Manufacturers Association	W.O. Vedder, Manager, Dust Control Department Pangborn Corporation Hagerstown, Maryland	A
(alternate)	F.C. Morey Parsons Engineering Corp. 2545 East 79 Street Cleveland, Ohio	
International Acetylene Association	O.G. Stam, Ind. Hygienist Industrial Toxicology Department Bakelite Corporation Bloomfield, New Jersey	B
(alternate)	Dr. A.G. Cranch, Industrial Toxicologist Union Carbide & Carbon Corp. 30 East 42 Street New York, N.Y.	
International Association of Governmental Labor Officials	Arthur A. Farrell N.Y. Department of Labor Div. of Industrial Safety Service Empire State Building New York 1, N.Y.	D
(alternate)	Frederick Weber Div. of Ind. Safety Service Empire State Building New York 1, N.Y.	
Manufacturing Chemists' Association of the U.S.	H.L. Miner, Manager Safety & Fire Prevention Division E.I. duPont deNemours & Co., Inc. 5019 duPont Building Wilmington, Del.	B

Organization Represented	Name and Business Affiliation	Classification
National Association of Fan Manufacturers	H.M. Fisher Westinghouse Electric Corp. Sturtevant Division Hyde Park, Boston 6, Mass.	A
(alternate)	E. Szekely Bayley Blower Co. Milwaukee, Wisconsin	
National Association of Mutual Casualty Companies	C.R. Williams, Chief Industrial Hygienist Liberty Mutual Insurance Co. Loss Prevention Department 175 Berkeley Street Boston 17, Mass.	F
(alternate)	J.C. Stennett, Director Accident & Fire Prevention Division National Association of Mutual Casualty Companies 910 Michigan Avenue Chicago 11, Illinois	
National Electrical Manufacturers Association	R.W. Monroe P.O. Box 2025 Buffalo 5, New York	B
(alternate)	Wm. S. Finch General Electric Co. Schenectady 5, New York	
National Foundry Association	L.E. Roark, Exec Vice Pres National Foundry Association 120 La Salle Street South Chicago 3, Illinois	B
National Paint Varnish and Lacquer Association, Inc.	E.E. Hoffman, Director Industrial Finishers Division National Paint Varnish & Lacquer Association Inc 1500 Rhode Island Avenue, N.W. Washington 5, D.C.	B

Organization Represented	Name and Business Affiliation	Classification
National Safety Council	William Witheridge, Ventilation Consultant Research Laboratory Division General Motors Corp. P.O. Box 188 North End Station Detroit 2, Michigan	E
(alternate)	William F. O'Connor Department of Chemistry Fordham University New York 58, N.Y.	
U.S. Department of Interior, Bureau of Mines	Hylton R. Brown, Senior Engr Eastern Experiment Station U.S. Bureau of Mines College Park, Maryland	D
(alternate)	H.B. Humphrey, Mining Engr Bureau of Mines New Interior Building Washington 25, D.C.	
U.S. Department of Labor, Bureau of Labor Standards	William G. Griffin Bureau of Labor Standards Washington 25, D.C.	D
(alternate)	R.P. Blake Bureau of Labor Standards Washington 25, D.C.	
U.S. Navy Department, Bureau of Ships	Bureau of Ships Navy Department Washington 25, D.C.	B
Members-at-Large	Leslie Silverman, Asst Prof of Industrial Hygiene School of Public Health Harvard University 55 Shattuck Street Boston 15, Mass.	E
	Dr. Leonard Greenburg, Executive Director Div. of Industrial Hygiene N.Y. Department of Labor 30 Center Street, New York	D

CLASSIFICATION

A - Manufacturers
B - Employers
C - Employees
D - Governmental Bodies
E - Independent Specialists
F - Insurance Representatives

Total: 25

PHG

AMERICAN S[illegible] ASSOCIATION
70 East Forty-fifth Street New York 17, N. Y.

29/59

PRIVATE COMMITTEE DOCUMENT
NOT FOR PUBLICATION

M I N U T E S

ASA SECTIONAL COMMITTEE ON SAFETY CODE FOR EXHAUST SYSTEMS, Z9

April 27, 1951

(Subject to Confirmation)

A meeting of the Sectional Committee on Safety Code for Exhaust Systems, Z9, was called to order by Mr. T.F. Hatch, Chairman, at 10 a.m., in Room 2946 of the ASA offices.

FOR ACTION

Present

Hatch, T.F., Chairman	American Industrial Hygiene Assn
Bowerman, E.R.	American Electroplaters' Society
Brandt, Allen D.	American Public Health Assn
Brown, Hylton R.	U.S. Bureau of Mines
Stern, Arthur C.	American Society of Mechanical Engineers
Tilden, P.V. (Alt for W.G. Griffin)	Bureau of Labor Standards
Weber, W.F.	American Society of Safety Engineers
Yaffe, C.D.	U.S. Public Health Service

ASA Staff

Lamb, Henry G., Acting Secretary

1. Subcommittee on Solid Materials Handling. The chairman reported that Mr. John Kane, chairman of this subcommittee, had been unable to attend this meeting but had talked with him about a month ago. Mr. Kane was having some difficulty in arranging the facts and information available in accordance with the general setup which had been agreed upon for these standards. It had been hoped that one standard could be developed for all solid materials handling but Mr. Kane had found such differences between the handling of grain and the handling of foundry materials that he had questioned if all of these substances could be included in a single standard.

Mr. Stern suggested that Mr. Kane be requested to develop a draft for the foundry operations and a separate draft for grain handling. He suggested that perhaps after these drafts had been prepared, certain similarities might become evident whereby in the future it might be possible to pick out the common characteristics in order to develop a single standard for materials handling operations. He realized that in addition to the common characteristics there might be some special characteristics with regard to one or more of the particular industries which would require individual consideration.

Mr. Brown recalled that ventilation problems in grain handling probably included some elements which were not present in other industries. Many elevator operators simply act as storage agents for grain which they do not own. When grain is received, if ventilation to take out dust is applied before the grain is weighed, the elevator operators would be interested in having a maximum of ventilation in the thought that it might also entrap some grain. This had been such a problem in the past that the Weighmasters Association had now put in strict rules that the amount of ventilation before weighing is under the control of the weighmaster. After the grain has been weighed, the elevator operators want to apply as little ventilation as possible, both to prevent entrapment of grain and also to prevent excess drying of the grain which would reduce its weight. After storage, the elevator operators have to return or ship out the same weight of grain that they received.

The chairman suggested that if hoods were properly placed in grain handling operations, they could provide effective control of the dust with comparatively small volume of air movement.

It was agreed that Mr. Kane should proceed with his subcommittee work in order that he might present the full Z9 Committee with drafts on grain handling and foundry operations for further study.

2. Subcommittee on Surface Coating Operations. The chairman reported that he had talked with Mr. Silverman, as chairman of the subcommittee. Mr. Silverman had made very little progress as yet, but hoped to work on it during the summer and have a report or a draft ready for distribution to the full Z9 Committee early this fall.

Mr. Bowerman stated that he had been instructed by the American Electroplaters' Society, whom he represented, to urge the completion of the work on surface coating operations, as they were much needed by the electroplating industry.

3. Subcommittee on Fundamentals. The chairman reported that the replies received from the letter which he had sent to all members of the Z9 Committee as Z9/53 on December 8, had shown an overwhelming majority in favor of having the subcommittee on fundamentals continue its present work on a good practice manual. He also reported that many of the members also believed that there was a need for a document on fundamentals and that this subject should not be neglected.

The chairman believed that there was a real need for a statement on fundamentals with regard to ventilation work. He believed that this should go into such fundamental laws of physics as the theory of falling bodies and the entrapment of air whereby the amount of ventilation depends upon the height of the fall, and the theory of air movements as the result of radiation from a hot body. It was his thought that if everybody concerned had a real concept of these fundamentals, not only in the design of ventilation but in the original design of buildings and equipment and the layout of processes, that many fundamental changes could be made, which would greatly reduce the amount of ventilation required. He suggested

that perhaps the best theoretical design for ventilation would be to so arrange the processes and equipment that the required ventilation was reduced to zero and no ventilation system would be required at all.

Mr. Brandt, as chairman of the subcommittee, reported that his subcommittee had sincerely tried to make a revision of the present document on fundamentals but the more they worked on it the more it took the shape of a good practice manual. He had thought that it would be possible to develop a standard on fundamentals and keep all of the other material in an appendix, but the other members of the committee had not agreed with him. They now had a draft nearly ready for presentation to the Z9 Committee. It included nine sections on such subjects as shape and design of hoods, properties involved in capturing certain substances, collectors, inspection and maintenance of equipment. This draft would not make specific reference to any particular industry, as he had understood that the Z9 Committee would develop special codes for each particular industry, as it was needed.

Mr. Yaffe presented the Z9 Committee with a copy of "Industrial Ventilation" -- a manual of recommended practice, published by the American Conference of Governmental Industrial Hygienists, January 1951. The Committee appreciated this document and agreed that the copy should be kept in the ASA library for reference purposes of all parties concerned. Mr. Yaffe raised the question as to how the present work of the subcommittee on fundamentals would relate to the work already done by the ACGIH. Mr. Brandt replied that he had not yet had an opportunity to study the ACGIH code. He had obtained a copy and planned to study it in detail. It was his thought that the work of the subcommittee on fundamentals could be coordinated with the work already done by the ACGIH so that there should be comparatively little duplication of effort.

Mr. Brown suggested that in addition to the work already done he believed that it would still be necessary to have some kind of a document on fundamentals of exhaust systems. Mr. Brandt said that it had been his experience with plant engineers that most of them were not too much concerned with fundamentals. What they really wanted to know was how to solve their specific problem. A few engineers had a real intellectual curiosity and wanted to do a good job, but many other engineers wanted to make a decision as soon as possible and frequently called in the equipment manufacturers and leaned upon them heavily for the design of the complete installation.

The chairman suggested that perhaps there had been some difference of the concept by the various members of the committee as to what was meant by the term, fundamentals. He was concerned about the fundamentals of the flow of fluids in pipe and such other subjects as the dispersement of particles. Mr. Brandt stated that he had some of these subjects in the present draft.

Mr. Bowerman stated that as far as the electroplating work was concerned, he knew that many of the people in that industry were looking for a single document where they could find direct requirements for

ventilation. He hoped that this would include legal requirements, if any, the necessary information on design, and such other fundamentals as might help in the layout of equipment and the design of processes. Because of the present materials used in electroplating the ventilation problem had become a major problem in this industry and there was real interest in how the cost of this ventilation could be reduced. The chairman asked if there were a need to set up a new subcommittee on fundamentals at this time while Mr. Brandt's committee was working on the good practice manual. It was agreed that no additional subcommittee on this subject should be authorized at this time, with the thought that the members of the Z9 Committee should first have an opportunity to review the draft which Mr. Brandt's committee was now preparing. Mr. Brandt stated that he hoped his subcommittee could have a draft ready for distribution by early September.

4. New Subcommittees. Mr. Stern recalled that in 1948 a special subcommittee had considered various industrial operations and had submitted a report to the full Z9 Committee as Z9/31, dated April 20, 1948, listing a total of 10 different industrial processes which might warrant consideration by the Z9 Committee. He recalled that four subcommittees were established two or three years ago; one subcommittee had now completed its work and the three others were making such progress that their work would probably be completed within the next year. He suggested that this would be a good time to initiate work on one or more of the other subjects mentioned in their report, with the thought that each of the subcommittees required two or three years to complete a subject. Consideration was then given to the following subjects:

Mechanical Cutting and Abrading Operations
Abrasive Blasting Operations
Rock Cutting Operations
Molten Materials Handling Operations
Chemical Process Operations

The chairman recalled that in the past, consideration had been given to various subjects from two points of view -- first, the apparent need for the code in question, and secondly, the availability of information necessary for preparing the code. Mr. Tilden reported that the Bureau of Labor Standards was developing courses of inspection for labor inspectors on various subjects. He was now developing such a course on chemical hazards and he would therefore appreciate any work which could be done on chemical process operations. This course was intended to prepare inspectors in order that they would understand the normal chemical hazards which would be found in the average small industrial plant, rather than preparing them for activity in a large chemical plant. The chairman suggested that such a standard might not be too much help in the development of this course since the standard would only be concerned with exhaust ventilation and not all of the other safety requirements for chemical operations.

The secretary recalled that at present there was a conflict between the requirements of American Standard Safety Code for the Use, Care and Protection of Abrasive Wheels, B7.1-1947, and American Standard Grinding, Polishing and Buffing Equipment Sanitation, Z43-1941. He suggested

that when any work was done on the first subject that the subcommittee should endeavor to resolve this conflict.

After further considerable discussion, it was agreed that a new subcommittee should be established on the subject, Mechanical Cutting and Abrading Operations. It was understood that this subject would include all operations involving cutting, machining, sanding, grinding, polishing, buffing, snagging, sawing or other similar operations on wood, plastics, rubber, metal or other solid materials, but not including abrasive blasting or rock cutting.

It was also agreed that a new subcommittee should be established on the subject of Abrasive Blasting Operations. This subject would include the process of blasting metal or other materials by means of abrasive or metallic particles for the purpose of removing sand, rust, scale or paint, to produce certain finishes, or change the physical characteristics of the material.

It was agreed that no further subcommittees on process operations be initiated at this time.

5. Ventilation and Operation of Open-Surface Tanks, Z9.1-1951. Mr. Stern reported that as chairman of the subcommittee which had developed this standard he had received a request for an interpretation with regard to 2.1.1. In the middle of this paragraph there was a sentence as follows: "The relative explosion hazard is measured in terms of the open-cup flash point (flash point) of the substance in the tank in degrees Fahrenheit." Appendix A had included the flash points of many chemicals but many of these flash points had been determined by the closed cup method rather than by open-cup method. He recalled that in both the work of his subcommittee and the work of the Z9 Committee there had been a change of thinking between some of the earlier drafts and the final draft concerning the open-cup method and he believed that the present standard did not truly reflect the thinking of the committee. In the general discussion which followed it was explained that both open-cup and closed cup methods were used to determine flash points and that the difference in methods might account for a difference of 5 to 10 degrees Fahrenheit in the temperature of the flash point and that this difference probably was not too important as far as the use of this standard was concerned.

Upon motion by Mr. Stern, seconded by Mr. Brandt, it was

VOTED

that in any reprinting of the Z9.1-1951 standard the words "open-cup" and "(flash point)" be deleted in 2.1.1 so that the sentence would read: "The relative explosion hazard is measured in terms of the flash point of the substance in the tank in degrees Fahrenheit.", with the understanding that this should be considered an editorial correction.

29/59
April 27, 1951

6. Plans for the Next Meeting. It was agreed that plans should be made for a meeting of this sectional committee to be held some time in September, with the hope that at that time drafts or reports from the three subcommittees now active might be presented to the full committee.

The meeting was adjourned at 1:15 p.m.

Henry G. Lamb

Henry G. Lamb, Acting Secretary
Z9 Committee

HGL:PHG
May 2, 1951

AMERICAN STANDARD ASSOCIATION
INCORPORATED
70 East Forty-fifth Street New York 17, N. Y.
ASA

Z37/264

PRIVATE COMMITTEE DOCUMENT
NOT FOR PUBLICATION

MINUTES

ASA SECTIONAL COMMITTEE ON ALLOWABLE CONCENTRATIONS OF TOXIC DUSTS AND GASES, Z37

May 18, 1954

(Subject to Confirmation)

The meeting was called to order by the Chairman, Dr. Wm. P. Yant, at 10:10 a.m. in Rooms 2944-46 of the ASA offices, 70 East 45 Street, New York 17, N.Y.

Present

Yant, Wm. P., Chairman	(MatL)	Irish, Don D.	(MatL)
Berger, L.B. (alt for H.R. Brown)	(USDI BM)	Kaw, Kingsley (Liaison)	(CSA)
		Lanza, A.J.	(MatL)
Blake, R.P. (for Alice Hamilton)	(USDL)	McCord, Carey P.	(AMA)
		Schrenk, H.H.	(MatL)
Bowditch, Manfred	(MatL)	Seni, Fred W.	(MatL)
Cook, Warren A.	(ASSE)	Smyth, Henry F., Jr.	(MatL)
Cranch, A.G.	(MatL)	Snell, M.A.	(ACSC)
Dooley, Allan E.	(API)	Stokinger H.E. (Liaison)	(USPHS)
Drinker, Philip (alt for R.A. Kehoe)	(MatL)	Stratton, Reuel C.	(AICE)
	(AIHA)	von Oettingen, W.F.	(MatL)
Gurney, S.W.	(NAMCC)		

Laubly, C.S., American Lumbermens Mutual Casualty Co.
Low, Frank S., Foot Machinery & Chemical Corp.

Ainsworth, C., ASA Staff
Lamb, Henry G., Secretary Z37, ASA Staff

Absent

Bishoff, F.M.	(DA)	Hatch, T.F.	(MatL)
Cralley, Lewis	(APHA)	Machle, Willard	(MatL)
Drinker, Cecil K.	(MatL)	Nelson, Norton	(MatL)
Elkins, Hervey B.	(IAGLO)	Osborn, S.H.	(CSPHaNA)
Foulger, John H.	(MCA)	Sands, F.W.	(NSC)
Greenburg, Leonard	(ACGIH)	Vosburgh, B.L.	(MatL)
Haggard, H.W.	(MatL)		

Since a long period of time had elapsed since the last meeting of the Z37 Sectional Committee, upon suggestion of the Chairman, all those present introduced themselves, indicating which organizations they represented.

163. Approval of Minutes (Min 145). The Secretary reported that the minutes of the last meeting had been circulated as Z37/244.

Upon motion, duly made, and seconded by Mr. Gurney, it was

VOTED

that the minutes of the June 29, 1949 meeting (Z37/244) be approved as circulated.

Status of Technical Subjects under Z37. The Chairman recalled that a Status Report of the various technical subjects under the scope of the Z37 committee had been circulated to the members prior to the meeting (Z37/263). These subjects needed review from the standpoint of content, concentration, references and methods. This report (Z37/263) was discussed in detail as shown in Min 164 through Min 191.

164. Carbon Monoxide, Z37.1 (Min 18). Mr. Cook believed that the values already contained in the Z37.1 standard were good, and should be reaffirmed. He approved the idea of having two concentrations listed; one for an 8-hour day; a higher one for a shorter period of time. There was some discussion as to the wording of the standard so as to make it clear that if an employee were exposed to a low concentration for a long period of time, then it would be dangerous to have him exposed to the higher concentration even for a short period of time. This was a fundamental question since it applied to all of the gases. It was generally agreed that the Editorial Committee would have to explain this situation when writing the standard. It was suggested that a statement might be written which would say in effect that both concentrations could be used, providing the average exposure for the entire time interval was less than the lower concentration.

Some of the members believed the 400 ppm value should be included with the stipulation that it be used for only a short time. Others believed that time might be lost from work by allowing an employee to be exposed to such a high concentration, even for so short a time, since he could not then go into a lower concentration for the remainder of his 8-hour day.

Upon motion by Mr. Cook, seconded by Dr. Irish, it was

VOTED

that the Z37.1-1941 standard on Maximum Allowable Concentration of Carbon Monoxide be reaffirmed.

The Secretary explained that this vote would have to go to letter ballot of the full committee, and that upon approval it would have to be reviewed from the standpoint of style and format which had changed somewhat since 1941.

It was agreed that Z37.1 should be sent to the sectional committee for comments with regard to references and methods as shown in the text.

165. Hydrogen Sulfide, Z37.2 (Min 20). After a brief discussion, upon motion by Mr. Cook, seconded by Dr. Drinker, it was

VOTED

that the American Standard Allowable Concentration of Hydrogen Sulfide, Z37.2-1941, be reaffirmed after a canvass of the sectional committee for comments regarding references and methods.

166. Carbon Disulfide, Z37.3 (Min 21). It was pointed out that the American Conference of Governmental Industrial Hygienists agreed with the concentration of the American Standard on Carbon Disulfide.

Upon motion by Dr. McCord, duly seconded, it was

VOTED

that the American Standard Allowable Concentration of Carbon Disulfide, Z37.3-1941, be reaffirmed.

167. Benzene, Z37.4 (Min 19). Mr. Cook suggested that this standard be referred to subcommittee for revision with a recommendation that an effort be made to suggest a concentration in round numbers such as 100, 50, 25, 10 or 5. He hoped that intermediate figures could be avoided in order to denote the lack of preciseness in these figures.

Upon motion by Mr. Bowditch, seconded by Dr. Irish, it was

VOTED

that the American Standard Allowable Concentration of Benzene, Z37.4-1941, be assigned to a subcommittee for further study and revision.

168. Cadmium, Z37.5 (Min 156). The Chairman explained that there had been an American War Standard on this subject, but it had been withdrawn. It was now up to the committee to decide whether or not a proposed standard should be published for trial use and comment. Dr. von Oettingen suggested that the standard should be for oxides of cadmium rather than for cadmium. Dr. Drinker pointed out that although he approved of the present concentration for cadmium oxides, Cadmium in itself could not be breathed. It was further suggested by Dr. von Oettingen that the word "fumes" be used. Mr. Cook suggested that the committee consider setting up a separate standard for dusts of cadmium compounds. Dr. Drinker suggested sending out the present proposed standard on Cadmium Oxide Fumes, and later sending out another separate document for straight cadmium compounds.

Upon motion by Mr. Cook, seconded by Dr. von Oettingen, it was

VOTED

that the committee go ahead with a standard on Cadmium Oxide Fumes, in the meantime that the subcommittee study the need for and possibility of a standard on Cadmium Compound Dusts.

Upon motion by Dr. Lanza, seconded by Dr. von Oettingen, it was

VOTED

that the present standard be submitted to letter ballot of the committee as a regular standard rather than as a proposal for trial use and criticism.

The committee believed that in this way they would receive many comments which could be used as a basis for revision by the subcommittee.

Mr. Gurney stated that from his experience during the past few years, he believed the concentration now contained in the Z37.5 standard could be higher. However, since the standard was going out to letter ballot anyway, it was generally agreed to wait until all comments had been received from the members.

169. Manganese, Z37.6 (Min 126). Dr. McCord pointed out that as with Cadmium, any standard on Manganese should read Manganese Dioxide, rather than as Manganese only. There was some controversy as to whether 40 to 50 miligrams would be a safer concentration, or whether 60 miligrams was safe, as stated in the present standard.

Upon motion by Dr. Drinker, seconded by Mr. Stratton, it was

VOTED

that the American Standard Allowable Concentration of Manganese, Z37.6-1948, be reaffirmed with a change from Manganese to Manganese Dioxides.

170. Chromic Acid and Chromates, Z37.7 (Min 48). Dr. Irish asked if this standard included dichromates. He stated that during the past they had had trouble with dichromates under the present level. However, he believed that for chromates and chromic acid, the level of concentration was safe. He even believed that exposure somewhat above this level of 1 mg p 10 c.m. was in actual practice.

Dr. Lanza read a statement from the Public Health Service which stated in effect that those exposed to chromates and dichromates in the process of manufacture come up with a susceptibility to lung cancer several times greater than the average population. Since it was unknown why this situation existed, Mr. Bowditch suggested including a statement in the standard that it did not include consideration of cancer, and a reference to the USPHS publication. Dr. McCord suggested also the exclusion of allergies from chromium, from skin contact and possibly from inhalation.

Upon motion by Dr. Irish, seconded by Dr. McCord, it was

VOTED

that in view of the many unknown technical factors, this standard be referred to a subcommittee for further study and review.

171. Mercury, Z37.8 (Min 48). The committee was in general agreement that the present concentration for Mercury was satisfactory, with the possible exception of some of the newer organic compounds. Upon motion by Mr. Cook, seconded by Dr. von Oettingen, it was

VOTED

that the American Standard Allowable Concentration of Mercury, Z37.8-1943, be reaffirmed with the new title of "Mercury and Its Inorganic Compounds."

172. Arsenic and Arsine, Z37.9 (Min 152). The Chairman explained that the American War Standard Z37.9-1943 had been withdrawn because the concentration of 1.5 mg p 10 c.m. had been considered too low a value; 5 mg p 10 c.m. was the value now being used generally. It was up to the committee to decide whether there was a need for a regular standard on arsenic, and possibly arsine. It was agreed that the subjects should be separate, and that a standard on arsine should be developed.

It was pointed out by several of those present that arsine was very toxic, and people were afraid of it. Therefore, they would be careful of it no matter what the concentration was.

There was some discussion on whether the standard should be on Arsenic or on Oxides of Arsenic. Dr. Drinker suggested "Arsenic and Its Inorganic Compounds" for a title. Dr. McCord recalled that die castings caused many injuries because of the arsenic used in metal.

Upon motion by Dr. McCord, duly seconded, it was

VOTED

that a subcommittee explore the two items of arsenic and arsine and bring in separate reports.

Dr. Drinker suggested that Mr. Hervey B. Elkins be put on the subcommittee. He believed that Mr. Elkins' knowledge would be extremely valuable. Mr. Low suggested that a representative of Oldberry Electric Chemical Company in Niagara Falls should also be on the committee.

173. Xylene, Z37.10 (Min 129). Mr. Gurney pointed out that although the present concentration for Xylene, 200 ppm, was safe, it was an uncomfortable level, causing irritation. Mr. Bowditch suggested that the committee stick to health standards. He believed that where comfort levels were known, they might be added as secondary information.

Upon motion by Mr. Stratton, seconded by Dr. Irish, it was

VOTED

that the American Standard Allowable Concentration of Xylene, Z37.10-1948, be reaffirmed.

174. Lead and Certain of Its Inorganic Compounds, Z37.11 (Min 158). Mr. Bowditch, as Chairman of the subcommittee on this subject, reported that his subcommittee was now composed of the following members: Mr. Hervey B Elkins, Dr. John H. Foulger, Mr. William G. Hazard, Dr. Robert A. Kenoe, Dr. Sherman S. Pinto, and Mr. Herbert E. Stokinger. The subcommittee had now started consideration of possible changes in the present Z37.11, either in the form of a revised single standard or the substitution of several standards for lead compounds of varying toxicity, through correspondence between subcommittee members. He stated that his subcommittee was open for suggestions. The Chairman suggested that comments from the whole sectional committee might prove valuable, and that the members might wish to refer to Minute 158 of the previous meeting for further discussion on this subject.

Upon motion by Mr. Bowditch, duly seconded, it was

VOTED

that the report of the subcommittee be submitted to the whole Z37 sectional committee for comment which should be returned to Mr. Bowditch.

175. Toluene, Z37.12 (Min 79). Mr. Gurney believed that although the concentration of 200 ppm as stated in this standard was a safe level, it was also an uncomfortable one. As with the Xylene standard, it was decided to write the standard according to health levels, with added information concerning comfort.

Upon motion by Mr. Gurney, duly seconded, it was

VOTED

that the same subcommittee which was to reconsider the Xylene standard should also reconsider the Toluene standard.

176. Oxides of Nitrogen, Z37.13 (Min 76). Mr. Stokinger remarked that the ACGIH had now differentiated between the levels of toxicity of the various oxides of Nitrogen. NO_2 appeared to be the worst, and they had suggested a concentration of 5 ppm for it.

Upon motion by Dr. McCord, seconded by Mr. Cook, it was

VOTED

that the subject of Oxides of Nitrogen, Z37.13, be referred to a subcommittee for further consideration.

Dr. Drinker suggested that Mr. Grey from the Army Chemical Center would have a considerable amount of knowledge on this subject, and might be good to have on the subcommittee.

177. Methanol, Z37.14 (Min 74). Mr. Cook approved the present concentration of 200 ppm for Methanol. Mr. Gurney suggested 400 ppm, based on experience with spirit duplicators, and from the wood heel industry. He believed 200 ppm was unnecessarily low.

Upon motion by Mr. Cook, seconded by Dr. Irish, it was

VOTED

that the subject of Methanol be referred to a subcommittee for review of the present knowledge of it.

178. Styrene Monomer, Z37.15 (Min 151). Dr. Irish stated that although 400 ppm was a safe concentration for Styrene Monomer from the health point of view, 100 ppm was more practical for comfort. Mr. Low suggested the standard be sent out as a peace-time standard since it was widely used.

Upon motion by Mr. Sehl, duly seconded, it was

VOTED

that the Z37 committee process this and send it out as a regular standard, including a statement concerning 100 ppm as a comfort level.

179. Formaldehyde, Z37.16 (Min 88). There was considerable discussion concerning the difference between the health and comfort levels of this concentration. Mr. Berger stated that 10 ppm was uncomfortable. Dr. Irish stated that he believed even as low as 5 ppm was uncomfortable. Dr. Cranch stated that 20 ppm had at one time been considered safe, but that the comfort factor had brought it down to 10 ppm. He believed also that 5 ppm was the comfortable level. Dr. McCord reported that Formaldehyde was a sensitizing agent, and that certain individuals became highly alergic to this.

Upon motion by Dr. Cranch, seconded by Mr. Cooley, it was

VOTED

that Z37.16 be referred to a subcommittee with a recommendation that the 10 ppm be used with a note stating the comfort level as lower, and that some people may become sensitized by it.

180. Carbon Tetrachloride, Z37.17 (Min 150). The Chairman explained that at one time the Z37 committee had discussed this subject in considerable detail, but nothing had been developed on it other than a statement which had been prepared and distributed to interested parties (Z37.17/210). In view of the additional information available at the present time, it was up to the committee to decide what should be done.

Dr. Irish commented that 25 ppm was a good maximum value for carbon tetrachloride, but if an average value was needed, it should be dropped to 10 ppm. Dr. von Oettingen said that he had been impressed by the low exposures that had poisoned people who had been drinking alcohol.

Upon motion by Mr. Cook, seconded by Mr. Low, it was

VOTED

that the subject of Carbon Tetrachloride, Z37.17, be referred to Dr. von Oettingen's subcommittee for further study, with a request that a standard be prepared on the basis of information now available.

181. Methyl Chloride, Z37.18 (Min 122). Dr. Irish stated, and it was generally agreed, that the present standard was satisfactory as published in 1949. This statement was based on experience.

Upon motion by Dr. Irish, seconded by Mr. Schrenk, it was

VOTED

that the American Standard Allowable Concentration of Methyl Chloride, Z37.18-1949, be reaffirmed.

182. Trichloroethylene, Z37.19 (Min 112). It was stated that the concentration of 200 ppm was the same figure as published by the governmental group. However, Dr. Irish believed that the general average of 200 ppm was close to the top level. Mr. Blake pointed out that some people show high susceptibility to trichloroethylene. Mr. Schrenk remarked that the ACGIH had dropped their figure of 200 ppm, and then had gone back to it during the past year. There was definite evidence that a concentration of 100 ppm was safe. A department store had sold a large quantity of a rug cleaner containing trichloroethylene and from which there had been no poisoning.

Dr. Irish reported that on continuous long-time exposure of animals there had been an effect on growth with concentrations not far from 200 ppm. He preferred a concentration of 100 ppm. Mr. Gurney believed that a MAC of 100 ppm could be maintained on vapor degreasers, and that figures higher than this were an indication of poor performance.

Upon motion by Dr. McCord, seconded by Mr. Cook, it was

VOTED

that the Chairman should appoint a subcommittee which would consider trichloroethylene and methyl chloroform in separate reports.

183. Acrylonitrile, Z37.20 (Min 99). It was explained by the Chairman that this subject had been considered by the committee, but had been dropped because of lack of information. There was a suggestion to send out the present draft for comment. Mr. Cook believed that some information might be obtained from William E. McCormick of B.F. Goodrich concerning this subject. Dr. von Oettingen thought it would be better to receive comments from Mr. McCormick before circulating the draft to the committee.

Upon motion by Dr. Irish, seconded by Dr. von Oettingen, it was

VOTED

that the present draft on Acrylonitrile, Z37.20, be referred to a subcommittee for further study.

184. Silica (Min 146). The Secretary read the letter ballot which had been sent to the committee in November 1949, and which had resulted in five negative votes. Mr. Cook remarked that since 1950 the governmental industrial hygiene people and many other groups had been comparing dust exposures within the limits published by the governmental group, with its effect or lack of effect upon those people. His experience was that 5, 20, and 50 mppcf was a concept which was generally felt to be as close to the situation as possible with the data now available. It was pointed out that whereas the ASA made a change at 35 percent free silica, the governmental group used 50 percent. Mr. Cook believed that 50 percent was a better figure than the 35 percent because there were many mineral dusts that were in the 35 to 38 range. At 50 percent there were less natural minerals.

There was considerable discussion as to what the percentage should be in different operations. Mr. Berger didn't believe that coal mining operations could meet these standards. He also stated that "light field counting" did not give proper consideration to ultra

fine particles. Mr. Cook believed that if there were an American Standard on the subject, it would give the committee a tool to work with for controlling conditions.

Dr. Drinker suggested that the committee adopt the levels of the governmental group since they had already done the research work. He believed that if this committee were to do research work on this subject, they would come up with the same information, and it would be a waste of time. However, Mr. Gurney stated that he did not believe the governmental figures would meet practical everyday problems. They were still getting silicosis claims on cases where the values had been less than the governmental standards. As a rough estimate, he suggested half the governmental values as a safe level. Mr. Snell pointed out that there would always be some cases of silicosis because of individual susceptibility.

Dr. von Oettingen asked if the committee couldn't consider the particle sizes since he believed that was as important as the content of silica. Mr. Cook believed that the breadth of a limit set up for a dust should indicate the lack of precision of the knowledge on the subject. Even although the present knowledge was not precise, he believed there was a scientific basis for a standard on Silica. He felt that a publication as a tentative American Standard would be a contribution to the control of dust exposures.

Dr. Irish suggested that the whole subject be submitted to a new subcommittee so that it could be reworded to make it of some use with the qualification of lack of information, as a tentative standard. Mr. Bowditch agreed that some kind of a statement should be prepared even if it were to state that the government had a definite standard which could be used, but the Z37 committee did not believe they had enough information to develop a standard.

Upon motion by Mr. Cook, seconded by Mr. Bowditch, it was

VOTED

that this matter of silica dust be submitted to a subcommittee, with a request that it submit a report one month before the next meeting of the full sectional committee.

185. Cyclohexane, Cyclohexanol, Cyclohexanone, Methylcyclohexane, Methylcyclohexanol, Methylcyclohexanone, Nitroethane, 2-Nitropropane (Min 153 and 154). The Chairman explained that drafts on these substances had been prepared under a tentative standard procedure, and sent to all members of the Z37 committee. He read the introduction to these tentative standards. The Secretary explained that it would now be possible to turn these over to the Editorial Committee, and then send them to letter ballot of the whole committee. The Chairman preferred to ask Dr. Kehoe first if he wished to revise any of the values his subcommittee had set up.

Upon motion by Mr. Bowditch, seconded by Mr. Gurney, it was

VOTED

that Dr. Kehoe be asked if he still was in agreement with the present figures, or if he wished to revise them.

186. Radium and Radon Gas (Min 148). It was noted that Dr. Greenburg, as chairman of the subcommittee on this subject, had prepared a draft which had been sent out to this committee. Comments on the draft had been sent to Dr. Greenburg, but he had not yet replied. There was some question as to whether or not Dr. Greenburg still wanted to be on the committee since his change of assignment in work.

Mr. Stokinger remarked that he would like to accept the decisions of the National Bureau of Standards on this subject. However, it was pointed out by Mr. Stratton that the NBS expressed its values in a form that would be difficult for the Z37 committee to use. Before making a change, the views of the whole sectional committee would have to be considered. The Chairman agreed to write to Dr. Greenburg on this subject.

187. Chlorine (Min 155). Mr. Stratton's subcommittee had prepared a statement on this subject which recommended a concentration of 3 ppm (See Z37/263). Mr. Low stated that 20 ppm was low enough for health. Dr. Irish reported that carefully controlled experiments with humans exposed to between 3 and 5 ppm for four hours had produced reactions; sometimes there was difficulty in breathing, or a bronchial response. Mr. Stratton explained that the figure of 3 ppm in his report was a compromise figure. His subcommittee believed 3 ppm was as close on the high side as they could recommend. He had nothing further to add to that report. In answer to a question from Mr. Cook, Dr. Irish stated that he did not know whether 2 or 3 ppm were a better value, though he did believe 3 ppm was getting very high. Mr. Schrenk believed that if it were set at 2 ppm, the ACGIH might go along with this value. If it were set at 3 ppm, they might not go along with the committee, and then there would be two different figures in use. On the basis of new information, it was believed that the value should be stated at 2 ppm rather than at 3 ppm.

Upon motion by Mr. Cook, seconded by Dr. Irish, it was

VOTED

that the report be submitted to letter ballot at a level of 2 ppm.

188. Fluorine and Fluorides (Min 147). It was reported that at the last meeting the committee had decided there was not enough information available at the time to develop a standard on this subject. Mr. Low believed that the first job for the committee was to break this

subject down into the difference in characteristics between the various fluorine compounds: fluorine, HF, inorganic fluorides. The hazard from certain fluorides, hydrofluoric acid, etc., was not so much from direct exposure as from absorption into vegetation. Both Stamford Research and Battelle Institute had been working on this subject.

Mr. Stokinger believed that until the committee got beyond the solubility point there was no point in trying to differentiate between the different fluorides. He reported the results of a three-day symposium on this subject at Kettering Laboratory.

The Chairman believed that the subcommittee should be asked to study the subject further. Therefore, it was agreed to refer the subject back to the subcommittee.

189. Glycols. The Chairman read a letter from Mr. Henry Smyth in which it stated that his subcommittee had gone over the subject of glycol tests, and decided that there was not enough information available to develop a standard.

190. Nitromethane. The Chairman remarked that he would bring this matter to the attention of Dr. Kehoe in the hope that he would take it up with his subcommittee.

191. Sulphur Dioxide (Min 117). The Chairman reported that he would reactivate the subcommittee on this subject.

192. General Policies Concerning Form and Content of Proposed Standards (Min 143). Dr. Irish asked if the committee couldn't come up with a better concept of what it meant by "Standard." He believed such a definition was necessary before the members could intelligently decide on certain specifications.

The Chairman suggested that the committee adopt the term "Industrial Hygiene Standard" as a name rather than "Maximum Allowable Concentration." However, he believed that "Industrial Hygiene Standard" would have to be defined, and suggested for a definition, Standards of good practice.

Mr. Bowditch suggested the use of "Threshold limits" as used by the ACGIH. However, Dr. von Oettingen pointed out that since different individuals varied in susceptibility to certain chemicals, it would be impossible to set an absolutely safe limit. In any standard prepared by the committee it should be made clear that the concentration stated might be all right for the average person, but harmful to a sensitive individual. He did not think such a standard should be considered legal in a court. Mr. Bowditch suggested the insertion of the words "the average worker" to clarify this situation.

There was considerable discussion as to which of the following three terms should be used: Occupational Health Standards, Occupational Hygiene Standards, or Industrial Hygiene Standards. Mr.

Bowditch preferred the term Occupational Health rather than Industrial Hygiene. Mr. Cook stated that "industrial" was a broader term than "occupational" in that it included any activity. Dr. von Oettingen said that sometimes things which were occupational were not industrial. Several of the members pointed out that although "industrial hygiene" had been the common term used over the country in the past, "occupational" was coming more and more into common usage.

Upon motion by Mr. Cook, duly seconded, it was

VOTED

that the term "industrial hygiene standards" be used to describe the values which the committee was discussing.

There was some discussion as to whether the maximum concentrations should be for safety or for comfort. It was realized that the standard should be based on an 8-hour working day; sometimes a reference indicating that a higher exposure would be safe for a shorter period of time would be appropriate. It was generally agreed that the concentration for safety be the basis of the standard with the understanding that a reference indicating a comfort concentration, where applicable, might also be included.

Mr. Bowditch suggested that the Chairman appoint a subcommittee to work out a preamble or a format for the standards to be submitted to letter ballot of the committee. He believed the letter ballot on the format would have to be taken before the committee could actually draw up any standards. The Chairman appointed Messrs. Bowditch, Cook, Irish, Kay, and Schrenk to this subcommittee.

There was considerable discussion concerning a separate publication in which various questions with regard to Z37 could be discussed. The publication could be made available as an introduction to anyone who might inquire about the Z37 standard. It was also brought out that references in the standards were important in order to show the background that had been considered by the committee in arriving at its decisions.

Upon motion by Dr. Irish, duly seconded, it was unanimously

VOTED

that the Z37 sectional committee adopt the idea of giving references in the completed standards as a basis for their reasons.

There was some discussion as to whether concentrations of metallic fumes should be stated in milligrams per 10 cubic meters as had been done in the past, or whether this should now be in tenths of a milligram per cubic meter as used by the ACGIH. Dr. von Oettingen recalled that 10 c.m. was about the amount of air inhaled during 8 hours of exposure.

Mr. Stratton preferred the use of 10 c.m. He pointed out that from the biochemists' point of view 1 c.m. was easier. However, in selling the standard to industry, 10 c.m. would be easier from a psychological point of view in that the allowed milligram would not then be in decimals. In answer to a question from the Chairman, Dr. Drinker stated that the governmental groups had not yet discussed this question. Some of the members stated both 1 c.m. and 10 c.m. were being used in the same plant.

Mr. Ainsworth reminded the group that the whole purpose of the American Standards Association was to coordinate the ideas of all groups. The fundamental job of the ASA was to correlate the different ideas presented. He believed that the Z37 committee should take a leadership in this subject since it would want its standards to be the standards of the whole country. Dr. Drinker agreed that uniformity was more important, no matter which figure was decided upon.

Upon motion by Dr. Irish, seconded by Mr. Stratton, it was

VOTED

that the Z37 Sectional Committee contact other organizations to try to get their opinions, and eventually get some uniformity as to whether to use 1 c.m. or 10 c.m. as a basis for concentrations.

193. Style and Format for Standards (Min 81). Dr. McCord remarked that as soon as this committee had settled on a real definition and explanation of what it meant by "Industrial Hygiene Standards," he hoped that this information could be given wide publicity. It might be reported in an article in the magazine "Industrial Hygiene and Toxicology." He also hoped that this could be published in several other magazines so as to get just as wide publicity as possible.

Mr. Ainsworth suggested that the subcommittee on this subject might wish to consider the possibility of having a single document which would be an introduction to all of the Z37 standards, with the idea that each individual standard might be published on the front and back of a single sheet. He reported that this system was now being used in one of the ASA projects on photography where they had many single sheet standards on photographic chemicals. Dr. von Oettingen remarked that in the field of photography most of the purchasers would be interested in standards for several chemicals; whereas, in industrial hygiene there would be a large number of people who might be interested in only a single standard from the Z37 committee. Mr. Bowditch remarked that in his work he might have occasion to send out 50 copies of a single standard from Z37, and that if this system were used, then he would also have to mail out 50 copies of the introduction. The Chairman suggested that if the Z37 standards

were published on single sheets, there might be a simple statement that they were "to be used in connection with the published introduction." It was agreed that these ideas should be referred to the subcommittee for further study.

194. Election of Officers (Min-118). The Chairman reported to the committee that Dr. C.D. Selby had resigned as Vice-Chairman of the committee, and also asked to be relieved of his duties as a member-at-large. He appointed a temporary nominating committee consisting of Messrs. Drinker, Chairman; McCord; and Bowditch to nominate a new vice-chairman.

After consultation, Dr. Drinker, as chairman, reported that the nominating committee had suggested the name of Mr. H.H. Schrenk. There being no further nominations from the floor, upon motion by Dr. Drinker, duly seconded, it was

VOTED

that Mr. H.H. Schrenk be elected Vice-Chairman of the Z37 Sectional Committee, and that the committee accept with regret the resignation of Dr. C.D. Selby.

The Nominating Committee was discharged.

195. Plans for Next Meeting (Min 162). The Chairman believed that in order for work of the Z37 committee to go forward successfully, there should be two meetings of the Executive Committee and two meetings of the full Sectional Committee a year. After some discussion, it was agreed to hold the meetings of the sectional committee in the middle of May and sometime in the Fall. The date of Friday, November 19, 1954 was definitely set for the next meeting to be held in Pittsburgh. This would be in conjunction with the Industrial Hygiene Foundation meetings.

Adjournment. The meeting was adjourned at 4:20 p.m.

Henry G. Lamb

Henry G. Lamb, Secretary
Z37 Sectional Committee

HGL:NF

6-15-54

AMERICAN STANDARDS ASSOCIATION
INCORPORATED
70 East Forty-fifth Street New York 17, N. Y.

ASA

Z9/77

PRIVATE COMMITTEE DOCUMENT
NOT FOR PUBLICATION

MINUTES

ASA Sectional Committee on Safety Code for Exhaust Systems, Z9

December 1, 1954

(Subject to Confirmation)

A meeting of the Z9 Sectional Committee was called to order by the Chairman, Mr. F.F. Hatch, at 10 a.m. in Room 2846 of the ASA offices.

Members Present

Hatch, F.F., Chairman		Fisher, H.M.	NAFM)
Andresen, V.V. (for W.N. Witheridge)	(NSC)	Kane, J.M.	DCEA)
		McDaniel, P.W. (for D.G. Stam)	IAA)
Bondy, W.S. (alt for W.M. Wallace)	ASHVE)	Stern, Arthur C.	ASME)
Bowerman, E.R.	(AES)	Stratton, Reuel C.	ACSC)
Brandt, Allen D.	(AIHA)	Williams, C.R.	NAMCC)
	(APHA)		

Others Present

Diggin, M.B. (alt) (AES) Robinson, K.E. (alt) (AIHA)
Lamb, Henry G., Acting Secretary (ASA Staff)

Members Absent

Brown, H.R.	USDI-BM)	Morse, K.M.	ACGIH)
Burke, Frank	CIO)	Navy Department	
Farrell, A.A.	IAGLO)	Roark, L.E.	NFA)
Greenburg, Leonard	MAL)	Silverman, Leslie	MAL)
Griffin, W.G.	SLStds)	Vedder, W.O.	FEMA)
Hoffman, E.E.	NPV&LA)	Weber, Wm. F.	ASSE)
Massari, S.C.	AFS)	Yaffe, C.D.	USPHS)
Miner, M.L.	MCA)		

1. Approval of Minutes. The Secretary reported that the minutes of the last meeting, held April 27, 1951, had been circulated as Z9/59 to the members. No corrections or additions had been received.

Upon motion by Mr. Stern, duly seconded, it was

VOTED

that the minutes of the April 27, 1951 meeting (29/59) be approved as circulated.

8. Scope. The Secretary gave a brief review of the expansion of the Z9 scope and the withdrawal of the Z5 project. Whereas the Z9 project had been active, and had published two documents; the Z5 project on Ventilation Code had done very little work. The sponsors of the Z5 project had suggested that Z5 be withdrawn; that the part on ventilation be included in the A53 project on Building Code Requirements for Light and Ventilation; and that the part on industrial operation be included in the Z9 scope. This suggestion had been submitted to ASA, and as a result, the Z5 project had been withdrawn, the A53 scope had been expanded to include mechanical ventilation, and the scope of Z9 had been expanded to include general ventilation as follows:

> Standards for the design, operation and maintenance of equipment to provide a safe atmosphere in industrial, manufacturing or construction operations by removing harmful substances by either local exhaust or general ventilation and by safely disposing of such substances; and such supplementary standards on personal protection as may be necessary to prescribe methods for the protection of workers.

A discussion followed concerning the broad implications of this change in scope. The Secretary explained that if the Committee wished to have its scope changed, it could present such a request to the ASA for consideration. Mr. Stern pointed out that the present scope permitted the committee to go as far as they wanted on the subject without actually getting into air conditioning which would be included under the A53 project. The members believed that the A53 and Z9 projects would not overlap, but that they should conform to each other. After a comparison of the old and new Z9 scopes, it was agreed to accept the present Z9 scope for the committee.

9. Report of Subcommittee on Fundamentals (Min 3). Dr. Brandt, as Chairman of the subcommittee, reported that around 1951 the members had met quite often to consider a revision of the Fundamentals Code. The subcommittee had gone into great detail on the revision, and Dr. Brandt believed the code had become too broad and had gotten away from the original purpose of Fundamentals. Recently less and less had been done by his subcommittee. Since the feeling seemed to be that the need for such a code which had existed in 1936 no longer existed, and because the feeling seemed to be that recently there had

been more published on this subject, Dr. Brandt suggested that the subcommittee be disbanded or re-organized with an entirely different group with a different point of view.

In answer to a question from Mr. Stern, Dr. Brandt admitted that the question of whether the present code should be revised, reaffirmed, or withdrawn had not been discussed. The Chairman stated that whereas the Fundamentals had served a useful purpose in the past, it was now out of date and needed revising if it were not withdrawn. The Secretary reviewed the fact that so little had been known about the subject when the document was published that it had not even been approved as American Standard, but published merely as a report. ASA was still receiving requests for the Report, and believed something should be done about it. He went on to suggest that if the Report were withdrawn, it might be of help if a report could be prepared which listed presently available information on this subject - a bibliography. Mr. Bowerman stated that in the electroplating industry ventilation work was often done by engineers with little or no experience, and he believed that if the Report were not revised, that at least a bibliography would be useful. Mr. Robinson agreed that the same situation existed in his experience, that although the material might be available, it either wasn't available to all who needed it, or else it just wasn't being used. Upon a question from Mr. Kane, the Secretary explained that although such a bibliography probably would not be suitable for approval as an American Standard, it would make excellent appendix material to a revised Report.

There was some discussion as to whether an American Standard on this subject might conflict with the ACGIH Manual, or whether it might simply be a duplication and therefore not worthwhile. Mr. Bondy also suggested that the committee might develop something which would be in conflict with state codes, but the Chairman hoped that the Z9 standard would be so fundamental it would transcend the differences in state requirements.

Dr. Brandt suggested that if the Report as it now stood were published, there would be a considerable amount of good practice material contained in it. Mr. Bowerman believed so strongly that a standard was needed he suggested the standard be finished, with thought to inclusion, or a separate publication, concerning good practice.

Mr. Stern pointed out that the main question at issue was whether or not a definite need for such a standard existed. Dr. Brandt recalled that the only reason he had suggested disbanding the subcommittee was that they didn't believe a need existed, especially considering so much material was available. It was finally agreed that from evidence presented at this meeting a real need for such a standard did actually exist.

Mr. Bowerman suggested that since so much work on a revision had already been done, it might be worthwhile to continue with revising it. Mr. Stern suggested that the subcommittee might wish to start with the existing document, or they could start completely from scratch. Dr. Brandt believed that

since so much work had already been put into the revision that it should not be dropped. The Chairman believed that although the actual fundamentals had not changed, points of view regarding them had changed, and consideration should be given to this fact.

Dr. Brandt stated that if the subcommittee were to continue with its revision, the members would want to know exactly what the sectional committee wanted included. He believed that in this way only could the subcommittee accomplish the job without getting into too much detail and good practice. Mr. Stern believed that since the two subjects of fundamentals and good practice merged so closely, it would have to be up to the subcommittee to keep them separate. Dr. Brandt agreed to get his subcommittee together for the purpose of reviewing their work and revising the Fundamentals Report.

10. Report of Subcommittee on Solid Materials Handling (Min 1). Mr. Kane, as Chairman of the subcommittee, reported that his subcommittee had been inactive since 1950. Before that time they had done much research, and had also included some good practice information. However, when they got into the three groups of operations (fan action set up by rotating equipment, entrained air, and static effect) the fundamentals became less clear. He explained that the situation varied in different industries, and that although ventilation experts in these industries were getting more and more down on paper, there was still very little information on this subject. Mr. Kane did believe, however, that the phase of fundamentals of materials handling might be a possible subject to work on since more material was now available at this time. He thought a fundamental document would be a good thing to have available for the purpose of warning people of the possible danger involved unless they had had actual experience with similar problems.

He went on to say that some experts had information available on materials handling in four ties. A similar group had evaluated good practices in grain and feed mill and flour mill industries. The information had looked good and had considerable value from a materials handling point of view. However, they had discovered considerable disagreement between the Mill Mutual Fire Prevention Bureau and their subcommittee concerning experience requirements. The subcommittee had tried to encourage ventilation engineers with stature and background to help them with their problem, but these men had been located so far apart that it had not been possible for them to get together to discuss the problem. Mr. Kane recommended that a new subcommittee be formed in order to approach the problem with new vigor and ideas.

The Chairman suggested that since information was available in industry, it might be advisable to use that information for examples. This would be in the hope of getting information that would eventually become independent of industry. There was considerable discussion concerning the need for a standard on this subject, and the members gave examples of that need. Mr. Stern suggested that the subcommittee list its most difficult problems and circulate them for comment and research.

Upon recommendation by Dr. Granut, the sectional committee asked the subcommittee to continue with what they had, together with newly available material, and to reconsider the standard on the original basis for bulk materials handling; but in the event that a standard could not be developed on that basis, that it then be put on an industry basis. Mr. Kane agreed to go ahead with the work.

11. Report of Subcommittee on Surface Coating Operations (Min 2). Mr. Stern reported that Dr. Leslie Silverman, chairman of this subcommittee, had been unable to attend this meeting, but had authorized him to report to the sectional committee for him. Mr. Stern stated that the last document put out by the subcommittee was dated June 1953, a 10-page supplement to the draft of the proposed standard. He believed that the draft was pretty well advanced and did not need much more work on it before it could be completed. He had no specific instructions, and didn't believe he was in a position to commit the subcommittee. He suggested, however, that Dr. Silverman be asked to expedite the pace with which his subcommittee operated. The draft was a consolidation of task group reports, some of which were more nearly complete than others. Dr. Williams agreed to speak to Dr. Silverman about this matter.

12. Election. The Chairman recalled that he had submitted his resignation as chairman of the Z9 sectional committee some time ago, and that it was now necessary to elect a new chairman. A nominating committee was appointed; upon their recommendation Mr. Stratton moved, it was duly seconded, and unanimously

VOTED

that the new Chairman of the Z9 Sectional Committee be Mr. Stern, and Mr. Robinson be the Vice Chairman.

Mr. Stern took the chair.

It was recalled that Mr. Katen had previously represented the AIHA on this committee. Upon motion duly made and seconded, it was unanimously

VOTED

that Mr. I.F. Katen be elected a member-at-large on the Z9 Sectional Committee.

13. Plans for Next Meeting (Min 6). It was decided that the next meeting of the sectional committee should be held as soon as reports from the various subcommittees could be completed. A tentative date was set for May 19, 1955.

14. Subcommittees on Mechanical Cutting and Shearing Operations and Abrasive Blasting Operations (Min 7). The Chairman recalled that at the last meeting some thought had been given to the establishment of these two additional subcommittees.

The Secretary read Min 4 of the minutes of the April 27, 1951 meeting. Mr. Hatch reported that at the Silicosis Conference in Australia it had been proposed that the Conference recommend that regulations be adopted prohibiting the use of sand as an abrasive material. This had been on the basis that the dust problem would be eliminated. However, since that idea had proved impractical, Mr. Hatch believed that initiation of a subcommittee on abrasive blasting operations would be appropriate.

Upon motion by Mr. Kane, duly seconded, it was

VOTED

that work on the subjects of mechanical cutting and abrading operations, and abrasive blasting operations be initiated by the Z9 sectional committee.

The Chairman suggested that perhaps Mr. W.C.L. Hemeon would be willing to chairman a subcommittee on abrasive blasting operations. He agreed to appoint subcommittees on these two subjects.

5. Ventilation and Operation of Open-Surface Tanks, Z9.1-1951 (Min 5). Mr. Kane stated that he had been impressed by tabulations made by New York State, and wondered if it would be appropriate to include that as supplemental data in the Z9.1 standard. The Chairman believed it would be better to refer the standard back to the subcommittee, with a recommendation that the members consider inclusion of the tabulations.

Upon motion by Mr. Stratton, duly seconded, it was

VOTED

that the Z9.1 subcommittee review the Open-Surface Tank standard with a view to revision.

The Chairman appointed Mr. Bowerman as chairman of this subcommittee.

The meeting adjourned at 1 p.m. subject to the call of the Chair.

Henry G. Lamb

Henry G. Lamb, acting Secretary
Sectional Committee Z9

HGL:NF

12-10-54

AMERICAN STANDARDS ASSOCIATION
INCORPORATED
70 East Forty-fifth Street New York 17, N. Y.

ASA

Z37/274

NOT FOR PUBLICATION

M I N U T E S

ASA Sectional Committee on Allowable Concentrations of Toxic Dusts and Gases, Z37

May 13, 1955

(Subject to Confirmation)

The meeting was called to order by the Chairman, Dr. William P. Yant, at 1:35 p.m. in the Conference Rooms of the ASA offices, 70 East 45 Street, New York, N.Y.

Members Present

Yant, Wm. P., Chairman	(MatL)	Nelson, Norton	(MatL)
Bowditch, Manfred	(MatL)	Schrenk, H.H.	(MatL)
Cook, Warren A.	(ASSE)	Smyth, Henry F., Jr.	(MatL)
Cranch, A.G.	(MatL)	Snell, M.A.	(ACSC)
Dooley, Allan E.	(API)	Stratton, Reuel C.	(AICE)
Foulger, J.H.	(MCA)	von Oettingen, W.F.	(MatL)
Irish, Don D.	(MatL)	Vosburgh, B.L.	(MatL)
McCord, Carey P.	(IMA)		

Others Present

Low, Frank S., Westvaco Division, Food Machinery & Chemical Corp.
Lamb, Henry G., Secretary, ASA Staff

Absent

Bishoff, F.M.	(DA)	Kay, Kingsley (Liaison)	(CSA)
Brown, Hylton R.	(USDI-BM)	Kehoe, R.A.	(AIHA)
Cralley, L.J.	(APHA)	Lanza, A.J.	(MatL)
Drinker, Philip	(MatL)	Machle, Willard	(MatL)
Elkins, H.B.	(IAGLO)	Osborn, S.H.	(CSPHANA)
Greenburg, Leonard	(ACGIH)	Sands, F.W.	(NSC)
Gurney, S.W.	(NAMCC)	Sehl, Fred W.	(MatL)
Haggard, H.W.	(MatL)	Stockinger, H.E.	(USPHS)
Hatch, Theodore F.	(MatL)		

210. Approval of Minutes of Last Meeting (Min 196). The Secretary reported that the minutes of the meeting of November 19, 1954 had been circulated to all members as Z37/271. Dr. von Oettingen had written on December 20, 1954 concerning Minute 202

on page 7. He stated that one sentence should be corrected to state that he had reported that all but one member of his subcommittee was willing to accept 10 ppm as an average allowable concentration rather than as a maximum allowable concentration. Mr. Warren Cook, by letter of December 21, 1954, had advised that on page 11 he had mentioned his interest in regard to chlorinated nitro-hydrocarbons. Mr. Irish, by letter of January 24, 1955, had recalled that in Minute 208 Dr. H.H. Schrenk was actually chairman of the subcommittee, and he had only been appointed a temporary chairman for the meeting on November 19 because Dr. Schrenk had been unable to be active at that moment. Dr. Cranch also recalled that in Minute 197 the third paragraph on page 3 should show that he had also received comments from Mr. McDaniel. He explained that Mr. McDaniel was not a member of the Manufacturing Chemists' Association.

With these corrections the minutes were approved as circulated.

211. Carbon Monoxide, Z37.1, Hydrogen Sulfide, Z37.2, Carbon Disulfide, Z37.3, Manganese, Z37.6, Mercury, Z37.8, Methyl Chloride, Z37.18 (Min 197). The Chairman recalled that these standards were to have been reviewed by the Editorial Committee as far as bibliography, etc. was concerned. The subcommittee had finished its work, and was waiting for the format to be decided upon.

212. Cadmium Oxide Fumes, Z37.5 (Min 198). The Secretary reported that 27 affirmative votes had been received on the letter ballot (Z37/270) which had been sent out on this question. The ballot could now be closed, and the information submitted to a subcommittee to be written up in the new style, with a maximum acceptable concentration of 0.1 milligram of Cadmium per cubic meter of air. The Chairman agreed to appoint this subcommittee.

213. Xylene, Z37.10, Toluene, Z37.12, Styrene Monomer, Z37.15, Formaldehyde, Z37.16 (Min 199). It was reported that Dr. Smyth's subcommittee had considered the comfort levels of these substances and had the information ready for the Editorial Committee to write up in the new format.

214. Lead, Z37.11 (Min 200). Mr. Bowditch reported that he had not been able to get his subcommittee together to prepare a detailed report for submission to the Z37 sectional committee. He would do this, requesting comments from the members.

215. Oxides of Nitrogen, Z37.13 (Min 201). The Chairman reported that Dr. Stockinger had submitted a draft of changes to his subcommittee, but had not yet advised the ASA of any definite conclusions. It was decided that no action should be taken on this subject until Dr. Stockinger's draft was ready and submitted to the sectional committee for comment.

216. Carbon Tetrachloride, Z37.17 (Min 202), Trichloroethylene, Z37.19, Tetrachloroethylene, Ethylene dichloride, Methyl chloroform, Dichloromethane (Min 203). Dr. von Oettingen reported that his subcommittee had all these standards except the one for Methyl chloroform ready to be written up in the new style. They did not have sufficient information as a basis for arriving at a decision on commercial Methyl chloroform because of the addition of stabilizers. He understood that Mr. Irish would get some information together on this subject. The Chairman suggested that Dr. von Oettingen's subcommittee wait until they had information on the stabilizers before doing any more work on this subject. Dr. von Oettingen agreed that when the Editorial Committee had decided on the new style, he would write up the final drafts himself.

217. Silica (Min 204). It was reported that Mr. Drinker and his subcommittee were ready to prepare a draft as soon as they had copies of the new style.

218. Radium and Radon Gas (Min 205). It was recalled that at the last meeting Mr. Harris and Mr. Stratton had agreed to prepare the final editorial details in accordance with comments which had been received, and submit a revised draft to the Secretary for submission to the sectional committee for letter ballot action. The Secretary reported that he had received a revised draft from Mr. Harris.

It was agreed that in preparing the final standard, mention would have to be made of the people on Dr. Greenburg's original subcommittee which considered this subject. Thanks were extended to Mr. Harris and Mr. Stratton for finishing this work.

219. Cyclohexane, Cyclohexanol, Cyclohexanone, Methylcyclohexane, Methylcyclohexanol, Methylcyclohexanone, Nitroethane, 2-Nitropropane, Nitromethane (Min 206). It was reported that these standards were ready for final letter ballot action, and it was suggested that Dr. Kehoe be requested to get the standards in final form for submission to ASA.

220. Chlorine (Min 207). The Chairman reported that Mr. Stratton's subcommittee had this standard ready for the editorial format.

221. Work in Progress. The Chairman recalled other standards in need of revision. Discussion on these substances is shown in Minutes 222 through 229 inclusive.

222. Benzene, Z37.4 (Min 167). It had been agreed that a subcommittee be appointed to study a possible revision of this standard. The following names were suggested as possible members: Hervey B. Elkins, L.T. Fairhall, Dr. Horace W. Gerarde, Dr. Leonard Greenburg, F.W. Sands, H.H. Schrenk.

223. Cadmium Dust (Min 168). It had been agreed that a subcommittee be created to study first the need for a standard on dust from cadmium compounds, and if it were decided that a need existed, to recommend a MAC value. The following names were suggested as possible members of the subcommittee: Anna M. Baetjer, S.W. Gurney, Dr. Harriet L. Hardy, Dr. Dudley Irwin, Dr. Frank Princi.

224. Chromic Acid and Chromates, Z37.7 (Min 170). The Chairman recalled that the meeting of May 18, 1954 had authorized the appointment of a subcommittee to review and study this subject. The following names were considered for membership on this subcommittee: Anna M. Baetjer, Willard Machle, Dr. Norton Nelson. Some representative of both the Public Health Service and the Berylium Corporation were suggested.

In answer to a question from Mr. Cook, the Chairman explained that a subcommittee on this subject would have to investigate the feasibility of evaluating the extent of the hazard before writing the standard.

225. Arsenic and Arsine, Z37.9 (Min 172). It was suggested that these two subjects should be considered separately. During the war there had been a standard on arsenic, but since then it had been withdrawn, and had never been reinstated. The Chairman suggested that a subcommittee be formed to explore the need for standards on these subjects. The following names were suggested for a subcommittee: Edward LeB. Gray, Kenneth M. Morse, K.W. Nelson or Dr. Sherman S. Pinto, Dr. L.W. Spolyar.

226. Methanol, Z37.14 (Min 177). The Chairman recalled that the present concentration for this substance was 200 ppm, and a question had been raised as to whether this was too low and might be raised to 400 ppm. The following names were suggested for a subcommittee: Dr. A.G. Cranch, Hervey B. Elkins, Dr. J.H. Foulger or R.G. McAllister, Dr. Carey P. McCord, H.H. Schrenk. Dr. Foulger suggested that someone from the hat industry might be helpful.

227. Acrylonitrile, Z37.20 (Min 183). A draft had been prepared on this subject, but because of insufficient information it had never been submitted for approval. A year ago it had been decided to organize a subcommittee to study this subject further. Names suggested for members of a subcommittee were as follows: William R. Bradley or Boyd C. Shaffer, W.E. McCormick, someone from duPont and from Union Carbide and Carbon Corporation. Dr. Cranch and Dr. Smyth agreed to look into this situation.

228. Fluorine and Fluorides (Min 188). A year ago it had been decided to delay standardization on this subject until more research had been done. Mr. Low reported that several laboratories were now working on this subject, such as: University of Washington, University of Oregon, Stamford University, and Battelle Memorial Institute. People suggested for future subcommittee work on this subject were: Harold Hodge, Dr. Dudley Irwin, E.J. Largent, Norton Nelson, H.E. Stockinger.

229. Sulphur Dioxide (Min 191). The following names were suggested to form a subcommittee to study this question: Mary Amdur, Isador Greenwald, Norton Nelson, Dr. Sherman S. Pinto or John N. Akersold, Joseph F. Freon, Jr. E.E. Evans of duPont had been suggested by Dr. Machle. Dr. Foulger doubted if Mr. Evans would have much information available on this subject.

230. New Substances (Min 157). The Chairman recalled that the Safety Standards Board had suggested to the Z37 sectional committee that it look into the following three substances as possibilities for standards.

Butadiene. The Chairman asked whether the members believed there was a need for a standard on this subject. He believed it mostly caused explosion hazards. Messrs. Smyth and Cook pointed out that as far as their experience was concerned, they did not believe there was a need for a MAC. It was agreed that Z37 recommend to the SSB that there was very little need for a toxicity standard on butadiene, and that the explosion hazard was most important.

Berylium. Mr. Cook reported that to his knowledge there had been no case due to berylium where exposures had been less than 1 or 2 gamma per meter. Mr. Bowditch mentioned that one company had put special warning labels on shipments of berylium they had sent out. Mr. Nelson said that the AEC used two standards on this subject; one for inside the plant and one outside.

Mr. Cook believed that there was enough data on this subject so that something could be done in the Z37 committee about arriving at a MAC for berylium oxide. He felt that if the committee could not agree on a standard, it might at least make a statement on this subject.

It was agreed that the Z37 committee should explore this situation, and in the meantime tell the SSB of their decision. People suggested for a subcommittee on this subject were: Merril Eisenbud, Harry Foreman or Dr. Thomas L. Shipman, Dr. Harriet L. Hardy, Dr. G.W.H. Schepers, James H. Sterner, C.R. Williams.

Alkali Dusts and Mists. Mr. Irish believed this was a broad subject, and Mr. Smyth agreed, saying it was too broad.

Members of the sectional committee suggested that sometime the committee might prepare a standard on ammonia. Other members suggested that work on this subject be deferred until a later date. It was agreed that Dr. von Oettingen's subcommittee should study the subject of methyl bromide. Dr. von Oettingen remarked that it might take the members quite a while to develop a standard on this subject. It was suggested that Dr. Kehoe be requested to submit information on chlorinated nitro-hydrocarbons in accordance with the suggestion by Mr. Cook at the last meeting.

Mr. Irish stated that his company had been working on many additional substances. They had provided information on this work to the ACGIH, and they were also reporting it to the Z37 committee simply for information purposes. Mr. Irish agreed to provide this information for the Z37 committee, and as soon as it is received it will be duplicated and circulated to the members of the Z37 committee.

It was agreed that these substances could be grouped so that they might be handled by about four subcommittees. Mr. Irish asked for volunteers to serve on his subcommittee with him. Mr. Smyth volunteered to work on some of these subjects. Mr. Irish also requested that each member of the Z37 committee study the values he had suggested, and send their comments to him. He would sincerely appreciate opinions from other members of the committee on these levels.

231. General Policies (Min 192). There was general discussion concerning the membership of the Z37 committee, and several suggestions were offered for additional members-at-large.

232. Style and Format for Standards (Min 193). The committee reviewed document Z37/273 which had been mailed to the members as a proposed foreword for the American Standard Acceptable Level as submitted by Mr. Schrenk, chairman of the subcommittee. It was agreed that "maximum allowable concentration" be changed to "maximum acceptable concentration." This would still leave the abbreviation "MAC."

Mr. Irish did not believe there was enough explanatory material about hazards in paragraph 2.3. He believed the physiological factors should be further explained. Dr. Schrenk agreed that this paragraph could be expanded to be more informative.

Mr. Low wondered if the committee were going to write one specification for inhalation and another for skin absorption, or whether all information on a given subject would be included in a single standard. The Chairman commented that if more were known about skin absorption then these could be written into the standards. It was agreed that all information on a given substance be included in a single standard.

Dr. Foulger asked whether the Z37 committee could add in paragraph 3.2 that where hazards other than inhalation were involved a special paragraph outlining the hazards be added. The Chairman stated that it was intended that this be put into paragraph 2.3 in discussing the material and its hazards.

It was agreed that the Editorial Committee should prepare a second draft of the foreword in accordance with this discussion.

233. Election of Officers (Min 194). The Chairman appointed a nominating committee consisting of Dr. McCord as chairman, Mr. Bowditch and Mr. Cook, to consider the replacement of the present chairman. Dr. McCord gave a report of their decision. They were not willing to accept a resignation from the present

Chairman. They felt that if there had to be a vacancy they would like to nominate Dr. W.P. Yant as Chairman, with no further election for one year hence. Dr. Yant accepted chairmanship for the ensuing year.

234. Plans for the Next Meeting (Min 209). It was agreed to hold the next meeting in Pittsburgh on November 18 which was the Friday ending the week of the meetings of the Industrial Hygiene Foundation. Dr. Schrenk agreed to make the plans to hold the meeting at the Mellon Institute. There would be subcommittee meetings in the morning, and the full sectional committee would meet in the afternoon.

Adjournment. The meeting adjourned at 4:00 p.m.

Henry G. Lamb

Henry G. Lamb, Secretary
Sectional Committee Z37

HGL:MF

6-10-55

AMERICAN STANDARD ASSOCIATION
INCORPORATED
70 East Forty-fifth Street New York 17, N. Y.

ASA

237/276
August 8, 1955

June 20, 1955

Proposed Foreword for American Standard
Acceptable Level of Exposure:

The Meaning of Maximum Acceptable Concentrations

For many years it has been recognized that there are levels of concentration of atmospheric contaminants to which a person may be exposed without known ill effects or discomfort. In view of the impracticability of maintaining uncontaminated air in most industrial situations, concentrations of contamination have been accepted for many materials commonly encountered in industrial operations. These concentrations in themselves do not represent a scale of relative hazard from toxicity. They represent the concentrations of contamination below which ill effects are unlikely to be experienced by any but hypersensitive individuals.

These concentrations are usually based upon data obtained by one of the following procedures:

(1) Laboratory tests on animals.
(2) Laboratory tests using human subjects.
(3) Environmental and medical investigations in plants.
(4) Some combination of the foregoing methods.

A common feature of these procedures is that the experimental exposure shall correspond to the normal work pattern. This should be taken into consideration also in the application of maximum acceptable concentration values.

Three criteria have governed in the establishment of these concentrations:

(1) Organic or other tissue changes.
(2) Functional reactions which have no discernible untoward effects on health but cause impairments, such as incoordination and increased proneness to accidents.
(3) Discomfort or adverse sensory effects.

In those cases where the concentrations have been established on the basis of organic changes, it is logical

to assume that repeated exposure to concentrations significantly in excess of the acceptable concentration probably would produce injury. Where the level has been established on the basis of a functional change or discomfort, it is logical to assume that exposure to concentrations not greatly exceeding the acceptable concentration would not necessarily produce material injurious effects. Hence it is important to understand the criteria upon which any such concentration has been established.

While the purpose of the acceptable concentration is to minimize health hazards, its immediate use is for guidance in establishing engineering procedures to prevent objectionable concentrations of toxic or obnoxious materials from being present in the air of work places. Comparison of the results of air analyses with these concentrations indicates acceptable conditions or otherwise the need, extent and urgency of control measures. Sampling and analysis should be carried out by competent personnel using an acceptable method which will provide a reliable measure of exposure.

Air analyses in conjunction with acceptable concentrations serve as a measure of exposure - not as a means of diagnosis of occupational disease. Such diagnoses should be based on a consideration of all factors, including results of clinical and physical examination as well as of air analyses and a knowledge of toxicologic effects of the materials in question.

In the application of the standards, it should be kept in mind that:

(1) The acceptable concentrations serve as standards of good practice.
(2) They serve as engineering guides for design and operation.
(3) They should be applied and interpreted by competent individuals with a full understanding of the basis and limitations of the information on which the standard is based.
(4) It is advised that these standards are considered to be guides toward good hygiene but are not suitable for the establishment of legal requirements.
(5) The levels are applicable only to exposure to a single substance. In the case of exposure to mixtures, the effect may be increased or decreased and controls should be based on the specific situation.

****

AMERICAN STANDARDS ASSOCIATION
INCORPORATED
70 East Forty-fifth Street · New York 17, N. Y.

ASA

Z37/296
December 28, 1956

To the Members of
Sectional Committee Z37

Correction to Minutes of Meeting

Gentlemen:

You will recall that we have just sent you minutes of the meeting of December 6 (Z37/295). We now find that an error was made on page 9. We are enclosing a corrected page 9. Will you please use this as a replacement in the minutes of this meeting.

Very truly yours,

Henry G. Lamb

Henry G. Lamb, Secretary
Sectional Committee Z37

HGL:NF
Encl.

cc: Alternates
Organizations

AMERICAN STANDARDS ASSOCIATION
INCORPORATED
70 East Forty-fifth Street New York 17, N. Y.
ASA

Z37/295

NOT FOR PUBLICATION

MINUTES

ASA Sectional Committee on Acceptable Concentrations of Toxic Dusts and Gases, Z37

December 6, 1956

(Subject to Confirmation)

The meeting was called to order by the Chairman, Dr. William P. Yant, at 10:05 a.m. in Rooms 2944-46 of the ASA offices.

Members Present

Yant, William P., Chairman	(MatL)	Low, Frank S. (alt to J.H. Foulger)	(MCA)
Schrenk, H.H., Vice Chairman	(MatL)	McCord, Carey P.	(IMA)
Bowditch, Manfred	(MatL)	alt to Robert A. Kehoe	(AIHA)
Brown, Hylton R.	(USDI-BM)	Nelson, Norton	(MatL)
Cralley, Lewis J.	(APHA)	Sands, F.W.	(NSC)
Dooley, Allan E.	(API)	Snell, M.A.	(ACSC)
Elkins, H.B.	(IAGLO)	Stokinger, H.E. (Liaison)	(USPHS)
Irish, Don D.	(MatL)	Stratton, Reuel C.	(AIChE)
Kay, Kingsley (Liaison)	(CSA)	von Oettingen, W.F.	(MatL)

Others Present

Ainsworth, Cyril, ASA Staff		McCollister, D.D.	(Guest)
Gurnham, C. Fred (alt)	(AIChE)	Lamb, Henry G., Secretary, ASA Staff	
Holtz, John C. (Guest)	(USDI-BM)		

Members Absent

Abernethy, D.	(BLS)	Machle, Willard	(MatL)
Bishoff, F.M. (Liaison)	(DA)	Osborn, S.H.	(CSPHA)
Cook, Warren A.	(ASSE)	Sehl, F.W.	(MatL)
Drinker, Philip	(MatL)	Smyth, Henry F., Jr.	(MatL)
Greenburg, Leonard	(ACGIH)	Vosburgh, B.L.	(MatL)
Hatch, T.F.	(MatL)	Williams, C.R.	(NAMCC)
Lanza, A.J.	(MatL)		

249. Approval of Minutes of Last Meeting (Min 235). The Chairman recalled that the minutes of the November 18, 1955 meeting had been circulated to all members as Z37/282. There being no corrections or additions, the minutes were approved as circulated.

250. Carbon Tetrachloride, Z37.17 (Min 240). The Chairman reported that the American Standards Association had received the formal submittal of this proposed standard from the U.S. Public Health Service which was acting as endorsing sponsor.

251. Formaldehyde, Z37.16 (Min 237). The Secretary reported that the draft of this standard had been sent to letter ballot in December 1955, and three negative votes had been received. Lewis J. Cralley had voted in the negative, questioning as to whether the technical work on Formaldehyde would support a MAC of 10 ppm. Hervey B. Elkins had voted in the negative. He believed that a standard for the comfort level should be shown first in the standard, and that the 10 ppm based on potential organic changes should be only mentioned afterwards. Dr. McCord had voted in the negative because paragraph 3.1 had shown "acceptable concentration" rather than "maximum acceptable concentration." It was agreed that this was an editorial matter which would be taken care of, and Dr. McCord asked to be recorded as having changed his vote from "no" to "yes."

Dr. von Oettingen commented that if a discomfort level were set up on the basis of a disagreeable odor, he believed that that was one thing. If on the other hand the comfort level were set up on the basis of irritation to the eyes, and if this irritation were so severe that people could not see what they were doing or where they were going, this might cause accidents in the plant. On that basis it might be a very important consideration.

Dr. McCord believed that certain people were allergic to Formaldehyde, and he wondered if the standard was concerned with allergies. Dr. von Oettingen believed this question had been taken care of in the preamble where it was stated that the concentrations were the maximum below which ill effects were unlikely to be experienced by any but hypersensitive individuals.

There was some discussion concerning the difference between the health level and the comfort level. Dr. Irish pointed out that the committee had already agreed that the safe level be the standard, and the comfort level be separate. It was generally agreed that the negative votes received on this ballot had been given due consideration.

Upon motion by Dr. Schrenk, seconded by Mr. Stratton, it was

VOTED

that it was the sense of this meeting that a consensus had been reached concerning a standard on Formaldehyde, and that it should now be submitted to the ASA for approval as American Standard.

252. Oxides of Nitrogen, Z37.13 (Min 239). The Secretary reported that the draft on Nitrogen Dioxide, Z37.13/292, had been referred to the Z37 Sectional Committee with letter ballot Z37/293. Up to the time of this meeting there had been 22 affirmative votes, one ballot marked "not voting" and one negative vote. The not-voting ballot had been submitted by Hylton R. Brown representing the U.S. Bureau of Mines. With it he had submitted a letter explaining that Mr. L.B. Berger, alternate on this committee for the Bureau of Mines, had also questioned some of this standard; and Dr. John C. Holtz, who was in charge of diesel testing at their Pittsburgh Station, had raised several technical questions concerning both the methods of test which had been shown in the standard, and also the maximum acceptable concentration of 5 ppm, particularly in its relation to the use of diesel engines in mining or other underground operations.

Dr. Foulger had voted in the negative because in his opinion the proposed level of 50 ppm NO_2 for 3 - 5 minutes exposure was too high. He reported some of the experiments in the Haskell Laboratory in 1941, and other observations concerning this level. Copies of the letter from Mr. Brown, including Dr. Holtz's comments, and the letter from Dr. Foulger had been sent to the chairman and vice chairman of the Z37 sectional committee, and also to Dr. Stokinger, chairman of the subcommittee which had developed this standard.

Mr. Brown had brought Dr. Holtz to this meeting, and Dr. Holtz very kindly presented his technical comments for the benefit of all members present.

Dr. Stokinger commented that the present draft was on the single item of nitrogen dioxide; whereas, the previous standard had covered oxides of nitrogen in general. He understood that the Army Chemical Center had reduced its own standard for nitrogen dioxide to 5 ppm.

The members appreciated the presentation made by Dr. Holtz, and asked many questions in order to clarify their thinking. After further considerable discussion it was understood that the letter ballot Z37/293 would be withdrawn in order that this draft could be referred back to Dr. Stokinger and his subcommittee so that they might further study the comments from Dr. Foulger and the Bureau of Mines.

253. Xylene, Z37.10; Toluene, Z37.12; Styrene Monomer, Z37.15 (Min 237); Trichloroethylene, Z37.19; Tetrachloroethylene; Ethylene dichloride; Methylene chloride (Dichloromethane) (Min 240). The Chairman reported that drafts of these standards had been sent to the secretary for submission to the sectional committee for letter ballot action.

254. Carbon Monoxide, Z37.1; Hydrogen Sulfide, Z37.2; Carbon Disulfide, Z37.3; Manganese, Z37.6; Mercury, Z37.8; and Methyl Chloride, Z37.18 (Min 236). Dr. Schrenk reported that drafts of these standards were still in the hands of the Editorial Committee. He had asked various individuals on his Editorial Committee to each work on the draft of one substance, and he hoped that these drafts would soon be ready to send to the secretary.

255. Benzene, Z37.4 (Min 245). Dr. Elkins, chairman of the subcommittee working on this substance, reported that he had sent the secretary a draft on Benzene with his letter of November 9. His subcommittee had brought down the level from 100 ppm to 25 ppm. The members felt that with this change there would be a desirable factor of safety, and they had therefore made the change.

Upon motion, duly made and seconded, it was

VOTED

that this draft be sent to the sectional committee for letter ballot action after the Editorial Committee had put it in final form.

256. Cadmium, Z37.5 (Min 212). The Chairman stated that he would set up a subcommittee to review the present standard. It was the intention that the committee would develop one standard on cadmium oxide fumes, and the committee would consider separately the need for a standard on cadmium oxide dusts. There had been some suggestions that the standard for fumes be at the level of 0.1 milligram of cadmium per cubic meter. It was thought that perhaps a different level might be used for the dust.

257. Methyl Chloroform (Min 240). Dr. von Oettingen reported that his subcommittee had developed a draft on commercially pure methyl chloroform. Most of the brand name products on the market included other chemicals as inhibitors, and he asked for instructions from the Z37 sectional committee as to what they should do.

Dr. Irish said that his company had studied this solvent with and without an inhibitor, and could not find any difference in the results. He recalled that in the past the Z37 committee had prepared standards for the commercially pure products, and had not developed standards for mixtures He believed that in connection with methyl chloroform the subcommittee should still stick to the commercially pure substance and not get involved in a mixture which would result from the use of inhibitors. He did not believe that the American Standard should mention brand names.

Dr. von Oettingen said that he would send his draft to Dr. Irish to be checked, and it could then be sent on to the Editorial Committee. It was agreed that this standard should be on methyl chloroform as such.

258. Methyl Bromide (Min 247). Dr. von Oettingen said that his subcommittee had prepared a report on this substance, and had agreed on the MAC as 20 ppm. However, two members, Dr. Stokinger and himself, had been concerned because 30 ppm in a larger group of persons was safe, and perhaps 20 ppm was a low concentration. He asked for the opinion of the members of the sectional committee. Mr. McCollister said that they were satisfied with 20 ppm.

Mr. Low believed that there had been some bad cases due to skin contact with methyl bromide. The Chairman recalled that this subcommittee had in the past discussed the possibility of enlarging its scope to include dermatitis, but had come to the conclusion that it had plenty of work to do for the present if it still limited its scope to matters of inhalation. Mr. McCollister stated that they had no evidence of systemic effects from skin contact, but were concerned with the problem of inhalation. Dr. Irish said that he believed that a splash of this chemical on the skin produced a definite hazard, but he had no evidence of absorption through the skin into the body.

Dr. von Oettingen presented a draft on methyl bromide as the work of his subcommittee.

Upon motion by Mr. Dooley, seconded by Dr. McCord, it was

VOTED

that the MAC for Methyl Bromide be set at 20 ppm, and that the draft of this standard should be sent to letter ballot of the sectional committee for final action as soon as the Editorial Committee had put it in final form.

259. Chromic Acid and Chromates, Z37.7 (Min 246). Dr. Nelson submitted a written report from his subcommittee as follows:

1. There is no new information known to the subcommittee which would suggest a better value for nasal irritation and perforation than the present standard of 0.1 mgm/M^3.

2. Exposures to chromium chemicals are associated with increased incidence of lung cancer. Neither the specific materials nor the concentrations responsible for this increase are known. Consequently there is no present basis for setting standards applicable to lung cancer.

3. It is recommended that:

a. Effort be made to secure new information for substantiation or revision of the present standard insofar as nasal irritation is concerned. It appears that several plants may now be in a position to provide such information. It would be useful to the subcommittee to have an official letter from the Z37 committee urging industrial cooperation in the collection and systematic analysis of current plant experience.

b. At such time as this new information is at hand the present standard should be reissued on that basis, and should include a statement explicitly noting that the standard has no relevance to hazard of lung cancer.

The Chairman suggested that the members might be continually on the lookout for information concerning the relationship between this substance and cancer. Dr. Nelson was authorized to write to various places for information in order to prepare a more formal recommendation for the sectional committee.

260. Lead, Z37.11 (Min 238). Mr. Bowditch reported that he had sent a draft to the secretary on November 29. His subcommittee had unanimously approved a value of 0.5 milligram of lead per cubic meter of air for lead chromate and lead sulfide. They had also recommended that the standard for metallic lead and all other of its inorganic compounds be 0.2 milligram of lead per cubic meter of air. His main question was with regard to the acceptable concentration. His subcommittee had unanimously approved the value; however, he had received comments from Messrs. Kehoe and Hazard concerning lead silicate. Dr. Elkins said that he had

some doubt as to whether or not this should be included, and believed there should be good evidence that it was not soluble in water, that it was not absorbed, and therefore not as toxic.

Dr. Schrenk thought that experience concerning the hazard of lead silicate versus lead oxide might be of help to the committee. The Secretary suggested that if the concentration were accepted as it now stood, then a revision could be begun immediately after approval. He thought this might be returned to the subcommittee before submission to final letter ballot. The Chairman wondered how long it would take for the subcommittee to get information on silicate. Dr. Nelson pointed out that the other standards in the Z37 series had been on the books for a long time, and he wondered if they had been restricted. Mr. Bowditch said that they needed to distinguish between the more soluble lead oxide and the chromate. Dr. Elkins said that only sulfide and chromate had been changed in Massachusetts. In answer to a question from Dr. Schrenk, Dr. Stokinger stated that their level was close to that of the ACGIH. The Chairman said Dr. Kehoe felt that he did not like to change values already set, but that in this case he thought they were not going outside the bounds of safety.

Upon motion by Dr. Nelson, seconded by Dr. Schrenk, it was

VOTED.

that the values set up in the draft submitted by Mr. Bowditch be accepted.

In accordance with a suggestion from Dr. Schrenk, Mr. Bowditch agreed to write to his subcommittee telling them of the various comments he had received, and asking for their opinions concerning inclusion of lead silicate.

261. Radium and Radon Gas (Min 242). Mr. Stratton stated that he had nothing new to report from his subcommittee. He said that he would try to get something definite down on paper within two months.

262. Chlorine (Min 244). Mr. Stratton said that he had nothing to report on this substance either. His subcommittee consisted of Messrs. Irish and Low, and although they had approved the values, they had to prepare a draft in the new style.

263. Cyclohexane, Cyclohexanol, Cyclohexanone, Methylcyclohexane, Methylcyclohexanol, Methylcyclohexanone, Nitroethane, 2-Nitropropane, Nitromethane (Min 243). The Chairman reported that Dr. Kehoe was working on these compounds, and had reported to him that drafts had been ready before the new format had been approved. Dr. Kehoe had agreed to revise the drafts in accordance with the new format, but as yet they had not been received.

264. Acetylene Tetra Bromide. Dr. von Oettingen said that he had agreed to write a standard for this substance, but as yet there was no published data. He felt that when the committee wrote a standard, it should have informative literature available for references so that the users could judge for themselves. Dr. Irish stated that they had finished work on this subject, and it would be published eventually. Dr. von Oettingen said he would hold up work on this substance until data had been published on it.

265. 2-Para Dichlorobenzene. Dr. von Oettingen said that his subcommittee had studied this substance and had thought that a level of 50 ppm would be safe. This had been suggested because a report from Dr. Irish had indicated that 70 - 80 ppm might be objectionable and might cause severe pain.

Dr. Irish reported that his company had done further work on this question and now believed that the maximum acceptable concentration could be set at 75 ppm. Mr. McCollister reported that some of the work on this substance had been published in 1956, and that they had concluded that pain at the lower level mentioned was not significant and they now believed that 80 - 100 ppm would be the pain level, and therefore believed that 75 ppm would be acceptable for a standard. Dr. von Oettingen stated that his subcommittee would give this further consideration.

266. Silica (Min 241). The Chairman recalled the report from Dr. Drinker which had been circulated to the members as Z37/294. He recalled the history of work on this subject which had begun in 1935, and which had been discussed many times since then. The Secretary reported that several letters had been received commenting upon Z37/294:

November 29, Warren A. Cook believed that this was an over-simplification. He favored using three groups of dust similar to that in the ACGIH classification, but there might be some value in limiting the dust in the 5 percent to 50 percent free silica group to 10 million particles per cubic foot. He also suggested that wherever possible the percentage of free silica should be based upon the concentration of samples of atmospheric dust rather than of the parent rock;

November 28, Lewis J. Cralley questioned the setting of airborne levels on the composition of parent material and the large groupings in the standard. He also believed that there should be a distinction between amorphous and crystaline forms of free silica;

November 26, Charles R. Williams did not believe that the use of two simple rock classifications could be applied generally throughout the United States although this had worked well for New York State. He also questioned basing the standard on silica content of the parent rock;

November 16, B.L. Vosburgh commented that some of the porcelain used by his company was in the 10 - 40 percent range, and he questioned the size of the steps. He suggested four steps as follows:

Above 50 percent	- 5 million particles
25 - 50 percent	-10 million particles
5 - 25 percent	-20 million particles
Under 5 percent	-50 million particles

November 13, Theodore F. Hatch did not believe that Drinker's proposal would serve for all of the silicosis problems across the country. He suggested that there should be a certain amount of leeway for the application of common sense. Personally, he had been using four steps whereby the highest silicosis risks he tried to limit to 2 million particles; for moderately high risk, 5 - 10 million particles; for low silicosis risk, 10 - 20 million particles; and for no evidence of silica, he tried to keep to less than 50 million.

November 19, Willard Machle in general concurred with Drinker's draft, but believed that some silicates might be converted to free silica, and therefore there might be some question in the use of the parent rock;

November 14, Carey P. McCord called attention to the hazards of exceedingly fine silica, and that the present light field technique of counting would not include these fine particles. He also commented on the wide variations within each of the two classifications;

November 13, F.W. Sehl suggested that the committee might consider a threshhold limit of 5 million particles of pure free silica using a sliding scale from this point, depending on the percentage of free silica in the dust;

November 13, Hervey B. Elkins preferred to see the standard based on the composition of the dust in the air, rather than the parent rock. He also commented on the large jumps in the standard;

November 9, Manfred Bowditch was not in favor of the large steps in the standard.

Mr. Dooley said that he had just received five letters, two of which favored the report, and three which opposed it. He said he would have copies of these letters sent to the secretary for the record.

Mr. Snell wondered what would be gained by accepting Dr. Drinker's report. The Chairman thought it should be possible to develop a standard considering the fact that there was dust control going on every day. He wondered what new approach the committee could take. There was considerable discussion concerning the phrase "parent rock" in Dr. Drinker's report.

Dr. McCord pointed out that it was impossible to set up any standard which would prevent all silicosis. Dr. McKay said that his group had been measuring quartz in city air, and found that it ran 5 - 10 percent in most of their samples.

Dr. Cralley thought that a statement on quartz might be good, but if it were limited to quartz on the basis of current knowledge, consideration would have to be given to air borne. He thought it would be better to consider quartz at first rather than to talk about generalities.

Dr. Nelson recalled that Dr. Lanza's subcommittee on this subject had believed that airborne dust should be analyzed, simplification seemed unnecessary. Dr. Lanza's proposal had been that a tentative standard should be set up using the "light field technique" of measuring as follows:

5 million particles per cubic foot less than 10 microns in diameter for all exposures where the dust content was 35 percent or more free silica, 10 million particles for dust containing 5 - 35 percent free silica, and 50 million particles where the dust content was less than 5 percent free silica.

Upon motion by Dr. McCord, seconded by Dr. Nelson, it was

VOTED

that the committee favored the earlier reports of Dr. Lanza's subcommittee over the more recent report of Dr. Drinker.

The secretary was instructed to advise Dr. Drinker of this action, and let him decide what further action, if any, he wanted to take.

267. General Policies (Min 248). There had been some discussion as to just what name should be used for certain compounds. It was generally agreed that where possible a good sound chemical name should be used, and if there was also a trade name for the same substance, then this should be shown in parentheses afterwards, such as, Dichloromethane (Methylene chloride).

268. Personnel. The Chairman reported that Howard Haggard had recently retired, and had resigned from the committee. There had been two or three other deplations from the membership. Consideration was given to the addition of new members to the committee. There was a general discussion of several names.

Finally, upon motion duly made and seconded, it was

VOTED

that Anna M. Baetjer, Eugene H. Krackow, Sherman S. Pinto, Frank Princi, C. Boyd Shaffer, Thomas L. Shipman, and John A. Zapp, Jr. be invited to serve as members-at-large on the Z37 Sectional Committee.

269. Sponsorship. The Chairman recalled that the Z37 Committee had been organized as an autonomous sectional committee under the ASA Procedures. This meant that the over-all committee did not have a sponsor, but that each individual standard developed by the committee had to be referred to some organization which would submit the standard to ASA for approval, thus acting as an endorsing sponsor.

He raised a question as to whether this committee should continue as an autonomous sectional committee or whether the committee should now come under the administrative sponsorship of some national organization as sponsor for the whole project.

Mr. Ainsworth recalled that when the Z37 project had been initiated, it had been decided that the best procedure to use was the autonomous sectional committee. That was in 1938, and since that time several additional organizations had come into the picture, and there had also been many other changes.

Mr. Bowditch suggested that it might now be satisfactory to invite the Public Health Service and the Department of Labor to sponsor this project. The Chairman thought this subject was closer to the hygienic field, and Mr. Schrenk suggested that the American Industrial Hygiene Association would be a good sponsor

since it cut across the whole field, including government, industry and insurance. Mr. Cralley suggested that the American Conference of Governmental Industrial Hygienists might act as co-sponsor in order to give proper coordination since that organization developed its own standards. Dr. McCord suggested that the Industrial Medical Association might act as a co-sponsor.

It was also suggested that the Industrial Hygiene Foundation might be in a position to serve as sponsor.

Upon motion duly made and seconded, it was

VOTED

that it was the sense of this meeting that the Z37 Committee should terminate its autonomous status, and that a single organization should be invited to serve as sponsor for this project.

Upon further motion duly seconded, and by secret ballot, it was

VOTED

that the American Industrial Hygiene Association should be invited to sponsor this project.

It was agreed that if by chance the AIHA did not wish to accept this invitation, then the Industrial Hygiene Foundation should be invited.

270. Election. Dr. Yant recalled that he had been chairman of the Z37 Sectional Committee for about 15 years, and because of the pressure of other work he had found it necessary to resign this job. He had appointed a nominating committee consisting of Messrs. Drinker, Smyth and Bowditch to consider a slate for chairman and vice chairman. Mr. Bowditch reported that the nominating committee had suggested Dr. Schrenk as chairman and Dr. Irish as vice chairman.

There being no further nominations from the floor, upon motion by Dr. Nelson, duly seconded, it was

VOTED

that Dr. Schrenk be elected Chairman and Dr. Irish be elected Vice Chairman of the Z37 Sectional Committee.

Dr. Yant turned the chair over to Dr. Schrenk. Mr. Bowditch moved a vote of grateful appreciation to the past chairman, and this was voted wholeheartedly by all present. Mr. Ainsworth recalled the years of service which Dr. Yant had given to the committee and expressed the great appreciation of the ASA for all he had done.

Adjournment. The meeting adjourned at 4 p.m.

Henry G. Lamb

Henry G. Lamb, Secretary
Sectional Committee Z37

HGL:NF

12-28-56

AMERICAN STANDARDS ASSOCIATION
INCORPORATED
70 East Forty-fifth Street New York 17, N. Y.
ASA

Z37/294
November 8, 1956

To the Members of
Sectional Committee Z37

Silica Dust

Gentlemen:

You will recall that a Subcommittee on Maximum Acceptable Concentration of Silica Dust has been headed by Philip Drinker. By letter of January 18 he has asked for an expression of opinion from the members of the Z37 Committee concerning the following proposal for Section 3 of such a standard:

Section 3
Acceptable Concentration

3.1 The acceptable concentration of silica dust in air breathed shall not exceed 5 million particles per cubic foot if the free silica content of the parent rock (or dust source) contains 10% or more of free silica. The acceptable concentration shall not exceed 50 million if the parent material contains less than 10% free silica.

In his letter Mr. Drinker recalls that this draft departs from the usual silica standard, such as the U.S. Public Health Service or the American Conference of Governmental Industrial Hygienists, by coming out and making two simple rock classes, one above and the other below 10% free silica in the parent rock. Mr. Drinker has taken this idea from the New York State codes.

Will the members please advise the secretary of any comments they may have concerning this proposal. Unquestionably this will come up for furtner discussion at tne meeting of December 6.

Very truly yours,

Henry G. Lamb

Henry G. Lamb, Secretary
Sectional Committee Z37

HGL:NF
cc: Alternates
Organizations

AMERICAN STANDARDS ASSOCIATION
INCORPORATED
70 East Forty-fifth Street New York 17, N. Y.

ASA

Z9/90

NOT FOR PUBLICATION

MINUTES

ASA Sectional Committee on Safety Code
for Exhaust Systems, Z9

~~December~~ 6, 1957
(Subject to Confirmation)

The meeting was called to order at 10:10 a.m. by the Chairman, Mr. Arthur C. Stern, in Room 5928 of the Grand Central Terminal Building, New York City.

Members Present

Stern, Arthur C. - Chairman	(ASME)	McDaniel, P.W.	(AA)
Robinson, K.E. - Vice Chairman	(NSC)	Peeps, D.J.	(NSPFEA)
Albisser, Robert H.	(MCA)	Tracy, W.E.	(AMCA)
Baken, Sydney	(USN-BS)	Vedder, W.O.	(FEMA)
Brown, Hylton R.	(USBM)	Weber, Herbert J.	(AFS)
Burke, Frank	(AFL-CIO)		

Others Present

Andresen, W.V. - alternate for National Safety Council
Caplan, Knowlton J. - Chairman, Subcommittee on Fundamentals
Lamb, Henry G. - Acting Secretary, Sectional Committee Z9 - ASA Staff

Members Absent

Baliff, Jack	(ACGIH)	Greenburg, Leonard	(MatL)
	(AGLO)	Griffin, W.G.	(USBLS)
Barnes, K.H.	(MatL)	Hatch, T.F.	(MatL)
Brandt, A.D.	(AIHA)	Hosey, A.D. - Liaison	(USPHS)
	(APHA)	Houghton, J.A.	(NAMCC)
DuBrul, E.C.	(WMMA)	Sheehan, C.T.	(FA)
Fidelius, W.R.	(AES)	Silverman, Leslie	(MatL)
Garlock, N.B.	(NPVLA)	Stratton, Reuel C.	(ACSC)
Gleason, R.P.	(ASSE)	Wallace, W.M.	(ASHAE)

35. Approval of Minutes (Min 25). The Secretary reported that the minutes of the meeting of December 7, 1955 had been circulated as Z9/85. No corrections or additions had been received.

Upon motion by Mr. Albisser, seconded by Mr. Andresen, it was

VOTED

that the minutes of the December 7, 1955 meeting be approved as circulated.

36. Subcommittee on Solid Material Handling (Min. 15). The Chairman recalled that for some time John Rane had been Chairman of this subcommittee, and had finally reported that neither he nor the other members of this subcommittee believed that it was practical to develop a standard on this subject. He had resigned as chairman, and Mr. Richard Dennis of the Harvard School of Public Health had been appointed as chairman but apparently nothing had been done since that time.

Mr. Brown recalled that Regulations for the Installation of Blower and Exhaust Systems for Dust, Stock, and Vapor Removal (NFPA 91, NBFU 91) had been submitted to the American Standards Association under the Existing Standards Method, and had been approved as American Standard Z33.1-1950. He was interested in the relationship of this document to the work of the Z9 Sectional Committee. It was stated that the NFPA document had been concerned with those features of exhaust systems which might propagate fire from one part of a building to another, and there did not seem to be any actual overlap between the work of the NFPA committee and the Z9 Sectional Committee. There did, however, appear to be enough mutual interest between these two committees so that the Chairman asked Mr. Brown if he would act as a lisison man between these two committees since he was already a member of both of them. Mr. Brown accepted.

After considerable further discussion and without formal vote it was unanimously agreed that the Subcommittee on Solid Material Handling should be continued on the basis that there was a need for such a standard.

It was realized that the work of most of the subcommittees under this project depended very largely upon the interest, energy and effectiveness of the chairmen of the subcommittees, and there was some question as to who might be chairman of this particular subcommittee in the future. After further discussion Mr. Robinson was asked to contact Mr. Alex Granam of the National Engineering Company in Chicago and ask him if he would be willing to be chairman of this subcommittee.

All of the members of the Z9 Sectional Committee were urgently requested to consider possible members of this subcommittee and to send their suggestions for such membership to the secretary.

37. Subcommittee on Surface Coating Operations (Min. 29). The Secretary reported that he had telephoned the chairman of this subcommittee, Doctor Leslie Silverman of the Harvard School of Public Health. Dr. Silverman could not attend this meeting; he also could not complete the work of his subcommittee for presentation to this meeting. His subcommittee had considered several drafts, and with a certain amount of work on the part of the chairman he would probably be in a position to submit a draft for consideration of the Z9 Sectional Committee. During the telephone conversation Doctor Silverman had said that he would try to work on this between now and the first of the year.

The Secretary was requested to write to Doctor Silverman and urge him to complete the work of his subcommittee at the earliest possible moment.

38. Subcommittee on Roller Coating (Min. 30). The Chairman recalled that Mr. Lapointe had been appointed chairman but he had resigned. At the present time there was not even a subcommittee organized. This subcommittee would be concerned

with operations such as the coating of cardboard, leather, linoleum, and the manufacture of artificial leather. No member present had any suggestions as to who might have the interest to carry on the work of this subcommittee at the present time.

After further discussion, upon motion by Mr. [illegible] seconded by Mr. Weber, it was

VOTED

that the Z9 Sectional Committee would postpone work on the subject of roller coating for the time being.

39. Subcommittee on Abrasive Blasting Operations (Min 31). The Chairman recalled that Mr. Barnes had been chairman of this subcommittee, but had resigned. A committee had been formed, but no meetings of the subcommittee had been held. Without a formal vote it was agreed that the work of this subcommittee should be continued. It was agreed that Mr. Vedder should be invited to serve as chairman of this subcommittee.

40. Subcommittee on Mechanical Cutting and Abrading Operations (Min 28). The Secretary reported that he had telephoned to Mr. Jack Baliff, chairman of the subcommittee. Mr. Baliff had been unable to attend this meeting. He had also advised that due to changes within his own department he was now finding it difficult to carry on effectively the work of this subcommittee. His subcommittee had held one meeting some time ago, but more recently had been inactive.

Mr. Weber had been a member of the subcommittee and was quite familiar with this subject. Upon invitation by the Chairman, Mr. Weber accepted chairmanship of this subcommittee. All members of the Z9 Sectional Committee are urged to send to Mr. Weber suggestions of those who they believe would be able to help in the work of this subcommittee.

41. Subcommittee on Ventilation and Operation of Open-Surface Tanks, Z9.1 (Min 27). The Chairman recalled that he had asked Mr. Bowerman to serve as chairman of a subcommittee to review the American Standard Safety Code for Ventilation and Operation of Open-Surface Tanks, Z9.1-1951. Mr. Bowerman had since had a change in his duties and had resigned as chairman of this subcommittee.

Mr. Robinson thought that one way to handle this work would be to send copies of this standard to about half a dozen people who were definitely interested in this standard, and ask if they had any suggestions for revision in the standard at this time. He suggested George Hama, Jim Barrett, and Jack Baliff who represented governmental agencies, and some people within the industry. In order to carry out this work it would be necessary to have an active chairman of this subcommittee. Upon invitation from the Chairman, Mr. Andresen agreed to be chairman of this subcommittee.

42. Subcommittee on Fundamentals (Min 30). Mr. Carlan, as chairman of this subcommittee, had recently provided multilith plates for a draft. These had been duplicated in the offices of the ASA as Z9 89, and copies were distributed to those present at the meeting.

Mr. Caplan reported that his subcommittee had questioned whether the subject of Fundamentals should be the scientific fundamentals or the practicing fundamentals. The committee had decided that the most useful document would be the practicing fundamentals, and the members had developed this draft on that basis. The part beginning on page 69 was the tables and illustrations which would be appendix material. The appendix material shown in this particular draft was merely illustrative of the material which would be put in the appendix, but there probably would be several changes between the present draft and the final document. This document had only been duplicated a couple days before the meeting, and there had been no opportunity to send copies to the members in advance of the meeting. Mr. Caplan, therefore, asked the committee merely to consider the document on a general basis rather than to be concerned with individual wording of individual paragraphs. It was recalled that this draft now had sections on the following:

I. Scope and Definitions
II. Plant Construction and Layout
III. Exhaust Hoods
IV. Exhaust Ducts
V. Air Cleaning Plant
VI. Exhausters
VII. Construction and Installation
VIII. Operation and Maintenance
IX. Checking Operation of Local Exhaust Systems

Without formal vote the committee agreed that all of these nine sections were appropriate, and that Mr. Caplan and his subcommittee had done an excellent job on the development of this fundamental information. Section I was reviewed more or less in detail. On Section II Mr. Tracy stated that he was very happy to see information included there on "Make-up Air."

Mr. Burke stated that he believed that there was a real need for a document such as this draft on Fundamentals, and he hoped that the committee would work toward its early completion.

After considerable further discussion, upon motion by Mr. Robinson, duly seconded, it was

VOTED

that it was the sense of this meeting that

(1) the draft Z9/89 should be referred to all members and alternates of the Z9 Sectional Committee for comments;

(2) a deadline should be set up on the basis of two months from the time that the copies are sent out;

(3) the comments should be sent to Mr. Knowlton J. Caplan, as chairman of the subcommittee, care of Mallinckrodt-Uranium Division, P.O. Box 442, St. Charles, Maryland;

(4) Mr. Caplan and his subcommittee should review the comments received, should prepare a revised draft, and send the revised draft to the Secretary of the Z9 Sectional Committee; and

(5) the Secretary, upon receipt of this draft, was authorized to send the draft to final letter ballot action of the Z9 Sectional Committee without waiting for any further meeting of this committee for purposes of discussion.

43. General Policies (Min 33). Mr. Burke was disturbed at the number of subcommittees which had not produced any tangible results since the last meeting of this sectional committee two years ago. He wondered if the trouble was that each chairman of the subcommittee had been permitted to appoint his own subcommittee. He suggested that the Z9 Sectional Committee appoint all of the members of the subcommittees. The Chairman remarked that in the work as presently laid out a great deal of responsibility devolved upon the chairman of the subcommittee. He recalled that on the Subcommittee on Abrasive Blasting Operations the complete personnel of the subcommittee had been established and reported two years ago, but because the chairman had resigned no one had called a meeting of this subcommittee, and no work had been done. He believed that the real key to future activity was in obtaining interested and aggressive chairmen of these subcommittees in order that they would call meetings of the subcommittee and get the various members to prepare material for future standards.

Mr. Andresen asked as to whether any work had ever been done on ventilation in the chemical industry. The Chairman reported that several years ago a special subcommittee had been set up to plan a program of work. This subcommittee had made a formal report dated May 4, 1948 which had been on the basis of developing standards for processes rather than for individual industries. It was hoped that a standard for a given process would be effective in any industry concerned with that process, and that the work would develop more effectively on that basis rather than to have a single standard; for instance, for the chemical industry. In line with this arrangement, the report of May 4, 1948 had included a recommendation that at sometime a subcommittee should be initiated on the subject of chemical processes, such as reacting, filtering, centrifuging, distilling, and other similar operations. Mr. Andresen was happy to know that such a subject had been given consideration, and agreed that no new subcommittee on this particular subject should be initiated at this time.

The Chairman recalled that the present officers of the sectional committee had been in office for some time, and he suggested that perhaps there should be some change in the officers.

Upon motion by Mr. Burke, seconded by Mr. Weber, it was unanimously

VOTED

that the present officers; namely, Mr. A.C. Stern as Chairman, Mr. K.E. Robinson as Vice Chairman, and Mr. Henry G. Lamb as Acting Secretary, be re-elected.

The Chairman recalled that at the present time there were four members-at-large on this committee: Mr. K.H. Barnes, Doctor Leonard Greenburg, Professor Theodore F. Hatch, and Doctor Leslie Silverman. Without formal motion it was agreed that Messrs. Hatch and Silverman should be continued as members-at-large. The committee suggested that letters be sent to Doctor Leonard Greenburg and to Mr. K.H. Barnes asking if they were still active enough in the field of ventilation, and if they had sufficient interest in this work to continue as members-at-large on this committee.

Upon motion, duly made and seconded, it was

VOTED

that Mr. Knowlton J. Caplan be invited to serve as a member-at-large on this committee.

Mr. Caplan accepted.

Adjournment. The meeting adjourned at 3:10 p.m., subject to the call of the chair.

Henry G. Lamb

Henry G. Lamb, Secretary
Sectional Committee Z9

HGL:MF

12-12-57