

**1954 TRANSACTIONS
VOLUME 1**

PLAINTIFF'S EXHIBIT

NSC-45

GENERAL SESSIONS

42nd National Safety Congress

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Women's Activities Session

(Two Round Table Discussions)

Presiding: Miss MARION E. MARTIN, Vice-President, Women's Activities, National Safety Council; Commissioner of Labor and Industry, Augusta, Me.

1. Safety Is Our Job

Moderator: MRS. VIOLA ARMSTRONG, Home Dept., Indiana Farm Bureau Cooperative Assn., Indianapolis, Ind.

Participants:

MRS. AGNES D. BEATON, Dir., Women's Div., Automotive Safety Foundation, Washington, D. C.

DR. IRMAGENE N. HOLLOWAY, Educational Consultant, Greater Cincinnati Safety Council, Ohio.

MRS. SALLY RANKIN, Dir., Home Div., Louisville Safety Council, Ky.

MRS. MARJORIE MAY, Dir., Home Safety, Greater New York Safety Council, N. Y.

2. We Work for Safety Tool

Moderator: MRS. FRED W. KNIGHT, Cartersville, Ga.; Safety Chairman, National Congress of Parents and Teachers, Chicago, Ill.

Participants:

MISS DOROTHY DOWNS, Safety Chairman, Rhode Island Assn. of Insurance Women, Providence, R. I.

MRS. J. HOWARD HODGE, Midland, Texas; Safety Chairman, General Federation of Women's Clubs, Washington, D. C.

JUDGE GERALDINE MACELWANE, Municipal Court, Toledo, Ohio.

ALICE C. MILLS, Dir., Women's Activities, National Safety Council, Chicago, Ill. (Substituting for Miss IRENE MUNTZ, Pres., Rochester, N. Y., Safety Council.)

Safety Exposition Exhibitors

NORTH AND SOUTH EXHIBITION HALLS

SECOND AND THIRD FLOORS—CONRAD HILTON HOTEL

- Acme Protection Equipment Co., Chicago, Ill.
Manufacturers—Industrial Gas Masks and Accessory Equipment.
- Admatic Corp., Chicago, Ill.
Manufacturers—Automatic Slide Projection Equipment.
- Advance Glove Mfg. Co., Detroit, Mich.
Manufacturers—All Types of Work Gloves, Safety Gloves and Leather Safety Clothing.
- Aetna Casualty & Surety Co., Hartford Conn.
Accident Prevention, both on and off the job—Driver Training Device.
- Alan Wood Steel Co., Conshohocken, Pa.
Manufacturers—AW Algrip Abrasive Rolled Steel Floor Plate.
- American Abrasive Metals Co., Irvington, N. J.
Manufacturers—Non-Slip Safety Stair Treads and Platforms.
- American Allsafe Co., Inc., Buffalo, N. Y.
Distributors—Industrial Safety and Fire Protection Equipment.
- American Chain & Cable Co., Inc., Bridgeport, Conn.
Manufacturers—Chains, Cable and Wire Rope of Various Kinds and Sizes; Steel and Malleable Castings; Brakes and Brake Controls; Cranes; Hoists; Valves and Fittings.
- American-LaFrance-Foamite Corp., Elmira, N. Y.
Manufacturers—Fire Apparatus and Fire Fighting Equipment.
- American Optical Co., Southbridge, Mass.
Manufacturers—Head, Eye and Respiratory Protective Devices; Safety Clothing and Safety Specialty Products.
- Ampco Metal, Inc., Milwaukee, Wis.
Manufacturers—Complete Line of Non-Sparking, Corrosion-Resistant Safety Tools.
- Ansul Chemical Co., Fire Equipment Divn., Marinette, Wis.
Manufacturers and Distributors—Ansul Fire Extinguishing Equipment.
- Arcadia Mfg. Co., Birmingham, Mich.
Manufacturers—Plastic Coated Gloves and Aprons for Industry.
- Armory Street Safety Shoes Divn., Commonwealth Shoe & Leather Co., Whitman, Mass.
Manufacturers—Safety Shoes.
- Award Incentives, Inc., New York, N. Y.
Manufacturers and Creators of Safety Incentives Award Programs, Emblems, Plaques, and Trophies.
- Ayerst Laboratories, New York, N. Y.
Manufacturers—Industrial Protective Creams.
- Bashlin, W. M., Co., Grove City, Pa.
Manufacturers—Linemen's and Industrial Safety Equipment.
- Bausch & Lomb Optical Co., Rochester, N. Y.
Manufacturers—Safety Lenses, Safety Eyewear, Ortho-raters.

Beryllium Corp., Reading, Pa.

Manufacturers—Safety Tools.

B. Alfred M., Co., Inc., New York, N. Y.

Polishers—Safety Maintenance and Production; Best's Safety and Maintenance Directory; Your Safety News.

Bethlehem Steel Co., Bethlehem, Pa.

Manufacturers—Wire Rope Slings, Standard and Braided Slings.

Better Light Better Sight Bureau, New York, N. Y.

Educational Information Concerning the Importance of Proper Lighting to Industrial Accident Prevention.

Bill-Jax, Inc., Archbold, Ohio

Manufacturers—Tubular Steel Scaffolding and Equipment. Portable Steel Bleachers.

Bone-Dry Shoe Mfg. Co., Neosho, Mo.

Manufacturers—Outdoor Footwear.

Bradley Washfountain Co., Milwaukee, Wis.

Manufacturers—Group Washing Equipment.

Brady, W. H., Co., Milwaukee, Wis.

Manufacturers—Self-Sticking Safety Signs, Pipe and Conduit Markers, Warning Strips and Squares, Dotted Line and Skip-Strip Aisle Markers, Pinstripe Stencils, and Other Special Markers and Signs.

Breck, John H., Inc., Springfield, Mass.

Manufacturing Chemists—Industrial Hand Cleaner; Hair and Scalp Preparations.

Bristol-Myers Products Divn., New York, N. Y.

Manufacturers of Pharmaceuticals.

Broome, Stewart R., Mfg. Co., New York, N. Y.

Manufacturers—Electrical Safety Equipment, Explosion-Proof and Vapor-Proof Portable Inspection Lites, Explosion-Proof Flashlites, Grounding Devices.

Brulin & Co., Inc., Indianapolis, Ind.

Manufacturers—Floor Treatments, Cleaners, Disinfectants, Insecticides.

Buhrke, R. H., Co., Chicago, Ill.

Manufacturers—Occupational Safety Equipment and Products for Construction and Maintenance.

Bullard, E. D., Co., San Francisco, Calif.

Manufacturers—Industrial Safety Equipment for Every Industry.

Vul-Cork Sole Divn., Cambridge Rubber Co., Taneytown, Md.

Manufacturers—Vul-Cork and Vul-Cork Neoprene Soles and Heels.

Chance, A. B., Co., Centralia, Mo.

Manufacturers—Hot Line Maintenance Tools and Line Construction Tools.

Charleston Rubber Co., Charleston, S. C.

Manufacturers—Lineman and Industrial Gloves, Sleeves, Aprons, Safety Devices.

Chemical Specialties, Inc., Springfield, Mass.

Manufacturers—Protective Hand Creams and Cleansers.

Chicago Eye Shield Co., Chicago, Ill.

Manufacturers—Head and Eye Protective Equipment.

Coca-Cola Co., Atlanta, Ga.

Manufacturers—Coca-Cola.

Columbus Glove Mfg. Co., Columbus, Ohio

Manufacturers—Coated Gloves and Aprons.

Columbus McKinnon Chain Corp., Tonawanda, N. Y.

Manufacturers—Alloy Steel Sling Chains.

C-O-Two Fire Equipment Co., Newark, N. J.

Manufacturers—Carbon Dioxide and Dry Chemical Extinguishers and Systems, Smoke Detectors.

Cunningham, M. E., Co., Pittsburgh, Pa.

Manufacturers—Safety Marking Tools.

Davis Emergency Equipment Co., Inc., Newark, N. J.

Manufacturers—Respiratory Protection, Combustible Gas Indicators, General Safety and First Aid Equipment.

Detex Watchclock Corp., New York, N. Y.

Manufacturers—Watchmen's Clocks.

Diversey Corp., Chicago, Ill.

Manufacturers—Slip-Free Absorbents, Non-Flammable Multi-Purpose Cleaners.

Dockson Corp., Detroit, Mich.

Manufacturers—Industrial Head and Eye Protection Equipment—Goggles, Face Shields, Helmets, Distributors—Eye Savers and Respirators.

Dow Corning Corp., Midland, Mich.

Manufacturers—Sight Savers and Sight Saver Cleaning Stations.

Dunn Products, Chicago, Ill.

Manufacturers and Distributors—Protective Clothing for Industrial Workers Made from Asbestos, Leather, Rubber, Neoprene and Fire-Proofed Duck.

Du Pont, E. I. De Nemours & Co., Inc., Wilmington, Del.

Manufacturers—Flame Retardant for Fabrics and Paper, Anti-Slip Floor Waxes, Protective Creams, Neoprene Products.

Eagle-Picher Sales Co., Cincinnati, Ohio

Producers—Eagle-Picher Industrial Floor-Dry No. 85. A heavy duty and anti-skid light reflecting absorbent for plant safety and maintenance.

E & J Mfg. Co., Burbank, Calif.

Manufacturers—Automatic Resuscitation Equipment for Emergency First Aid.

Edmont Mfg. Co., Coshocton, Ohio

Manufacturers—Coated Fabric Work Gloves.

Elliott Service Co., Mt. Vernon, N. Y.

Publishers—Accident Prevention Displays; Safety Conference Programs; Supervisor's Weekly Bulletin; Suggestion System Service.

Embosograf Corp. of America, New York, N. Y.

Manufacturers—Sign-Making Equipment, Safety Posters, Training and Visual Aids, Directory Signs.

Emerson, J. H., Co., Cambridge, Mass.

Manufacturers—Resuscitation Equipment.

Fairfield Glove Co., Fairfield, Iowa

Manufacturers—Industrial Gloves and Mittens.

Fendall Co., Chicago, Ill.

Manufacturers—Head and Eye Protection Equipment.

Fine Organics, Inc., New York, N. Y.

Manufacturers—High Flash, Low Toxicity Safety Solvents.

Fireye Divn., Electronics Corp. of America, Boston, Mass.

Manufacturers—Electronic Fire Detection Equipment.

Frank Mfg. Co., Mentone, Ind.

Manufacturers—Litters, Emergency Splints, First Aid Kits, Conn. Tourniquets, Fracture Equipment.

- Phelan Research Co., Philadelphia, Pa.**
Manufacturers—Anti-Slip Floor Maintenance Materials.
- Frommelt Industries, Dubuque, Iowa**
Manufacturers—Portable Welding Shield and Protective Heat Cloth.
- Jamswell Co., Newton Upper Falls, Mass.**
Manufacturers—Complete Industrial Fire Alarm and Watchmen's Reporting Systems.
- General Detroit Corp., Detroit, Mich.**
Manufacturers—General Quick Aid Fire Extinguishers and Allied Items.
- Globe Company, Chicago, Ill.**
Manufacturers—Grip-Strut Grating.
- Iraton & Knight Co., Worcester, Mass.**
Manufacturers—Safety Shoes, Leather Hand Guards, Protective Clothing, Linemen's Belts and Holsters.
- Gro-Cord Rubber Co., Lima, Ohio**
Manufacturers—Gro-Cord, Raw-Cord and Neo-Cord Soles, Heels and Taps.
- Haws Drinking Faucet Co., Berkeley, Calif.**
Manufacturers—Emergency Eyewash Fountains, Emergency Showers and Goggle Wash Fountains.
- Hewson, John, Co., New York, N. Y.**
Manufacturers—Automatic Ground & Process Controls, Staticator—Master Static Alarm Systems, High Speed Static Control Systems & High Voltage D.C. Insulation Test Tests.
- Floor Machine Co., Chicago, Ill.**
Manufacturer—Floor Cleaning, Maintenance Equipment and Supplies.
- Hillyard Chemical Co., St. Joseph, Mo.**
Manufacturers—Safe, Economical Floor Treatments, Building Maintenance, Sanitation Products, Equipment and Materials.
- Holland-Racine Shoes, Inc., Holland, Mich.**
Manufacturers—Men's McCOY Cushioned Safety and Dress Shoes.
- Hygiene Research, Inc., New York, N. Y.**
Manufacturers—Protective Creams for the Skin and Mistproofing Cloth for Goggles and Windshields.
- Hy-Test Divn., International Shoe Co., St. Louis, Mo.**
Manufacturers and Distributors—Safety Footwear; Also Conductive and Special Types for Atomic Usage.
- Industrial Gloves Co., Danville, Ill.**
Manufacturers—Leather, Asbestos, Duck, Wool, Woven-Gard Safety Apparel; Finger Guards.
- Industrial Products Co., Philadelphia, Pa.**
Manufacturers—IPCO Safety Equipment for All Industries.
- Institute of Industrial Launderers, Washington, D. C.**
A Complete Coverall and Wiping Cloth Service for Industrial Plants.
- Insto-Gas Corp., Detroit, Mich.**
Manufacturers—Underwriters and Factory Mutuals Approved Torches and Furnaces.
- Arstate Rubber Products Corp., Los Angeles, Calif.**
Manufacturers—Safety Rubber Trafficones.
- Iron Age Safety Shoes, H. Childs & Co., Inc., Pittsburgh, Pa.**
Manufacturers—Complete Line Men's and Women's Leather and Rubber Industrial Safety Footwear.

Jackson Products, Inc., Warren, Mich.

Manufacturers—Insulated Electrode Holders, Cable Connectors, Face Shields and Goggles.

Jomac, Inc., Philadelphia, Pa.

Manufacturers—Jomac Safety Gloves, Safety Sleeves, Hand Guards, Heat and Flame Resistant Gloves and Jomac Armorkote Gloves.

Jones & Co., Rumford, R. I.

Manufacturers—Jones Full Vision Visor Goggles.

Junkin Safety Appliance Co., Inc., Louisville, Ky.

Manufacturers—Power Press Guards, Grinding Wheel Shields, Stretcher Equipment.

Justrite Mfg. Co., Chicago, Ill.

Manufacturers—Safety Cans; Oily Waste Cans; Safety Electric Lanterns; Flashlights and Fire Extinguishers.

Karel First Aid Supply Co., Chicago, Ill.

Distributors—Industrial Hospital Supplies and Equipment.

Kelley-Mahorney Co., Louisville, Ky.

Manufacturers—Convoy Skid-Dash Proof Enamel.

Keystone View Co., Meadville, Pa.

Manufacturers—Original Binocular Visual Screening Tests for Industry.

Kidde, Walter, & Co., Inc., Belleville, N. J.

Manufacturers—Fire Detecting and Extinguishing Equipment.

Kimball Safety Products Co., Cleveland, Ohio

Manufacturers—Safety Devices for the Personal Protection of Workmen in Industry.

Klein, Mathias & Sons, Chicago, Ill.

Manufacturers—Linemen's and Electricians' Tools and Safety Equipment.

Kunz, J., Glove Co., Chicago, Ill.

Manufacturers—Linemen's, Bridgemen's and Welder's Quality Gloves.

Legge, Walter G., Co., Inc., New York, N. Y.

Manufacturers—Safety Floor Preparations; Conductive Floor Coatings; Static Grounding Devices for Personnel.

Lehigh Safety Shoe Co., Emmaus, Pa.

Manufacturers—Leather and Rubber Safety Footwear.

Lightfoot Schultz Co., New York, N. Y.

Manufacturers—Skin Cleansers, Powdered, Bar, Liquid; Skin Conditioners and Powdered Soap Dispensers.

Littell, F. J., Machine Co., Chicago, Ill.

Manufacturers—Punch Press Safety Equipment and Coil Handling Equipment.

Louisville Ladder Co., Louisville, Ky.

Manufacturers—Aluminum Ladders and Scaffolding Equipment.

Lowery Brothers, Chicago, Ill.

Wire Rope Splicing Service.

Luther Mfg. Co., Inc., Olean, N. Y.

Manufacturers—Power Press Guards.

Maico Co., Inc., Minneapolis, Minn.

Manufacturers—Audiometers, Auditory Training Equipment, Strethrons and Hearing Aids.

Marsh & McLennan, Inc., Chicago, Ill.

Insurance Brokers and Agencies.

Martindale Electric Co., Cleveland, Ohio

Manufacturers—Martindale Protective Dust Mask and Electrical Testing Instruments.

- Masury-Young Co., Boston, Mass.**
Manufacturers—Floor Maintenance Materials.
- McAn, Thom, Safety Shoe Divn., Melville Shoe Corp., New York, N. Y.**
Manufacturers and Distributors—Thom McAn Safety Shoes.
- McDermott, Julian A., Corp., Corona, L. I., N. Y.**
Manufacturers—Warning and Safety Lights for Municipal, Industrial, Utility and Aviation Use.
- McDonald, B. F., Co., Los Angeles, Calif.**
Manufacturers and Distributors—Industrial Safety Equipment.
- McJohn Corp., Los Angeles, Calif.**
Manufacturers—Automobile Safety Belts.
- Medford Mfg. Co., Medford, Ore.**
Manufacturers—Haggards' Folding Stretcher.
- Medical Supply Co., Rockford, Ill.**
Manufacturers—Flexible Unit First Aid, Snake Bite First Aid, Burn First Aid.
- Melflex Products Co., Inc., Akron, Ohio**
Manufacturers—Flooring Materials, Treads and Standing Mats.
- Metal Arts Co., Inc., Rochester, N. Y.**
Suppliers of Emblems, Jewelry, Metal, Plastic, Leather, Safety Awards.
- Metropolitan Life Insurance Co., New York, N. Y.**
Educational Publications and Materials Dealing with Safety.
- Micro Switch Divn., Minneapolis Honeywell Co., Freeport, Ill.**
Manufacturers—MICRO Switch Trip Controls for Power Machine.
- Milburn Co., Detroit, Mich.**
Manufacturers—Ply Skin Protective Creams, Ply Garb Safety and Protective Clothing, Plygova Plastic Coated Work Gloves, Ply Waterless Hand Cleaner.
- Miller Equipment Co., Inc., Franklin, Pa.**
Manufacturers—Linemen's and Industrial Safety Belts.
- Mine Safety Appliances Co., Pittsburgh, Pa.**
Manufacturers—Safety Equipment for Every Industry.
- National Mine Service Co., Beckley, W. Va.**
Distributors—Gas Indicators, Mine Lamps, and Tamping Plugs.
- National Safety Council, Chicago, Ill.**
- National Society for the Prevention of Blindness, Inc., New York, N. Y.**
Educational Material on Conservation and Utilization of Eyesight in Industry.
- Newman Mfg. & Sales Co., Kansas City, Mo.**
Manufacturers—Newco Combination Wire Rope Clamp and Thimble.
- Nichols Engineering Co., Chicago, Ill.**
Manufacturers—Safety Tank Car Unloading Platform, Safety Access Platform for Use in Loading, Unloading, Sampling and Washing Tank Cars.
- Occupational Hazards, Inc., Cleveland, Ohio**
Publishers.
- Oil-Dri Corp. of America, Chicago, Ill.**
Manufacturers—Oil-Dri Absorbents and Non-Slip Paint.
- Onox, Inc., San Francisco, Calif.**
Distributors—Onox Skin-Toughener and Footmats for Athlete's Foot.
- Osborn Mfg. Corp., Warsaw, Ind.**
Manufacturers—Safety Pliers and Tongs for Feeding Punch Presses.

- Pac-Kit Company, Greenwich, Conn.
Manufacturers—First Aid Equipment.
- Packwood, G. H., Mfg. Co., St. Louis, Mo.
Manufacturers—Safety Industrial Skin Cleansers and Dispensers.
- Patent Scaffolding Co., Inc., Chicago, Ill.
Manufacturers—Gold Medal Wood and Aluminum Safety Ladders, Magnesium Ladders, Suspended, Sectional Steel, Tubular Steel and Aluminum Scaffolding, Side-Walk Protection Canopies, Steel Grandstands and Fold-A-Way Scaffold.
- Pennsylvania Optical Co., Reading, Pa.
Manufacturers—Head and Eye Protective Equipment.
- Permamix Corp., Chicago, Ill.
Distributors—Industrial Floor Patching Material (PERMAMIX).
- Petersen Engineering Co., Santa Clara, Calif.
Manufacturers—PENG0 Safety Glass Transformer Gin, Safety Pole Grip, Screw Anchor Tool.
- Pioneer Rubber Co., Willard, Ohio
Manufacturers—All Neoprene; All Rubber; Neoprene Coated; Vinyl Coated; Custom Dipped Rubber Goods Gloves.
- Porto-Clinic Instruments, Inc., New York, N. Y.
Manufacturers and Distributors—Driver Testing and Training Equipment and Visual Aids for Driver and Traffic Safety.
- Positive Safety Mfg. Co., Cleveland, Ohio
Manufacturers—Power Press Guards.
- Power Actuated Tool Manufacturers' Institute, New York, N. Y.
Association of Manufacturers of Powder Actuated Tools.
- Prairie State Products Co., Chicago, Ill.
Manufacturers—Industrial Safety Signs, Luminated and Plain Safety Bulletins.
- Protectoseal Co., Chicago, Ill.
Manufacturers—Fire Prevention Equipment for Flammable Solvents.
- Pulmosan Safety Equipment Corp., Brooklyn, N. Y.
Manufacturers—Respirators, Eye Protection, Helmets, Protective Clothing, Asbestos and Leather Gloves.
- Pyrene Mfg. Co., Newark, N. J.
Manufacturers—Diversified Approved Fire Extinguishers, Recharges, Air Foam, Playpipes, Systems.
- Racine Glove Co., Inc., Rio, Wis.
Manufacturers—Gloves, Apparel, Protective Equipment, Leather, Asbestos, and Steel Reinforced.
- Radiator Specialty Co., Charlotte, N. C.
Manufacturers—SAFE-T-CONES Rubber Traffic Guides.
- Randolph Laboratories, Inc., Chicago, Ill.
Manufacturers—Carbon Dioxide Fire Extinguishers, Dry Chemicals on Automatic Systems.
- Reece Wooden Sole Shoe Co., Columbus, Neb.
Manufacturers—Reece "Perfect Rocker" Wooden Sole Safety Footwear.
- Robbins Instrument Corp., Attleboro, Mass.
Manufacturers—Automatic Regulated Tourniquets, Field and Hospital Models Circlecuf, Blood Pressure Unit.
- Rockwood Sprinkler Co., Worcester, Mass.
Manufacturers—Automatic Fire Protection Systems; Sprinklers, WaterFog, Fog-Foam, and Foam.

- Roebbing's, John A. Sons Corp., Trenton, N. J.
Manufacturers—Wire Rope, Wire Rope Slings and Fittings.
- Rose Mfg. Co., Denver, Colo.
Manufacturers—Safe-Hi Products.
- Safety Box Toe Co., Boston, Mass.
Manufacturers—Safety Steel Box Toes.
- Safety Clothing & Equipment Co., Cleveland, Ohio
Manufacturers—Safety Clothing and Equipment for Every Type Industrial Worker.
- Safety First Products Corp., Elmsford, N. Y.
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- Safety First Shoe Co., Holliston, Mass.
Manufacturers—Safety Steel Toe Shoes for Men.
- Safety Tower Ladder Co., Burbank, Calif.
Manufacturers and Distributors—Safety Equipment for Ladders and Scaffolds.
- Salisbury, W. H., & Co., Chicago, Ill.
Manufacturers—Linemen's Rubber Protective Equipment.
- Sani-Mist, Inc., Philadelphia, Pa.
Manufacturers—Athlete's Foot Prevention.
- Sawyer, H. M., & Son Co., Cambridge, Mass.
Manufacturers—Foul Weather and Safety Clothing and Aprons.
- Schrader's, A., Son, Brooklyn, N. Y.
Manufacturers—Pneumatic Press Controls, Valves, Cylinders and Associated Products.
- Scientific Industrial Supply Co., Chicago, Ill.
Manufacturers—Gloves, Clothing and General Safety Equipment.
- Scott Aviation Corp., Lancaster, N. Y.
Manufacturers—Scott Air-Pak, Demand Inhalator, Demand Respirator, Hydro-Pak.
- Sellstrom Mfg. Co., Palatine, Ill.
Manufacturers—Face and Eye Protection Equipment.
- Speedi-Dri Corp., Philadelphia, Pa.
Manufacturers—Oil and Grease Absorbents.
- Standard Safety Equipment Co., Chicago, Ill.
Manufacturers and Distributors—Industrial Safety Equipment.
- Steel Scaffolding Co., Inc., Brooklyn, N. Y.
Manufacturers—"Trouble Saver" Steel Scaffolding.
- Stepan Chemical Co., Chicago, Ill.
Manufacturers and Distributors—pH 6 and Neutra-Foam Skin Cleansers for Industrial Plants.
- Stephenson Corp., Red Bank, N. J.
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- Stonehouse Signs, Inc., Denver, Colo.
Manufacturers—Steel Accident Prevention Signs.
- Stop-Fire, Inc., Brooklyn, N. Y.
Manufacturers—Fire Extinguishers.
- Surety Rubber Co., Carrollton, Ohio
Manufacturers—Rubber Gloves and Linemen's Equipment.
- Surdy Mfg. Co., Inc., Chicago, Ill.
Manufacturers and Distributors—Safety Equipment for Wood and Metal Working Industries.

Swiveller Co., Inc., Brooklyn, N. Y.

Manufacturers—Swiveller Universally Adjustable Lighting Products.

Taylor, S. G., Chain Co., Hammond, Ind.

Manufacturers—Taylor Made Alloy Steel Sling Chains and Tayco Safety Hooks.

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Manufacturers—Emergency All-Purpose Splints.

Trinal, Inc., Chicago, Ill.

Manufacturers—"Safeet" Protection for the Metatarsal Arch.

U-C-Lite Mfg. Co., Chicago, Ill.

Manufacturers—BIG BEAM Portable Electric Hand Lamps, Emergency Lighting Equipment.

Union Wire Rope Corp., Kansas City, Mo.

Manufacturers—Wire Rope, "Tuffy" Slings, "Tuffy" Towlines.

United States Safety Service Co., Kansas City, Mo.

Manufacturers—Industrial Goggles, Protective Hats, Faceshields, Welding Helmets, Impregnated Salt Tablets, and Allied Safety Equipment.

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Service—Cleaners and Processors of Industrial Protective Clothing.

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Manufacturers—Activating Signals for Traffic Warning Signs; Illuminated Directional Control Signs. Distributors—Highway Warning Signs; Traffic Marking Paint.

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Woodbridge Ornamental Iron Co., Chicago, Ill.

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Leadership for Tomorrow's Safety

By DONALD C. POTTS

President, Pittsburgh Steamship Div., U. S. Steel Corp., Cleveland, Ohio

The safety movement in this country has traveled a long way since the day the slogan, "Safety First" was invented, and the leadership which the Propeller Club has nurtured and contributed to the marine industry is a conspicuous jewel in the treasury of American maritime history.

It occurs to me that this year's joint meeting marks a momentous milestone in the march of maritime progress. As the St. Lawrence Seaway construction swings underway, it signals the beginning of a new era in which we on the greatest inland seas of the world will join hands more closely with our salt water brothers.

With this new era will come not only great opportunities for all of us but great responsibilities and problems as well.

Men devoted to making this a safe world in which to work and live, we have our job blueprinted for us so that we can be prepared for the day when the locks swing open and more and different types of craft heretofore not common to the Great Lakes, and manned by crews inexperienced in our waters mingle with us in pursuit of commerce.

As Propeller Club men we have much thinking and planning ahead of us to make the most out of new situations.

Frankly, the situation calls for new and greater leadership on the part of all of us.

Looking at our past performance, I am sure there is much to give us heart for what the future will demand from us. Our Propeller Club has brought the people of the maritime industry together, helping all of us focus a critical light on our achievements and the challenge of our problems.

Through the club's leadership, the American people are becoming more conscious of the maritime industry's importance and its problems, and new impetus and direction has been given to our need for still more effort to win the recognition it honestly deserves.

Our work has helped coordinate and direct joint activities of our marine people in adopting new technical, safety and operating techniques on an industry-wide scale. It has

contributed largely to the exchange of ideas we have enjoyed recently, covering every problem from maritime safety to national defense.

Your Propeller Club has sponsored legislation which helped to restore funds to the ship building program, going back to the grass roots, to our individual port organizations to get the leadership that helps us win our objectives.

The dissemination of fine ideas and constructive thoughts which come out of our Merchant Marine Conferences helps us take our case to the people. The circulation of these proceedings to thoughtful people everywhere advertises the excellent leadership we have in our industry.

This expression of leadership augurs well for us as we prepare to win the goals of our future.

The St. Lawrence Seaway is a milepost dramatizing the march of events. It is, by comparison, a magnificent but modest example of the great need for enlightened leadership to assure our achieving the full potential of our destiny.

What sort of a yardstick might we use to measure this destiny—the next 45 to 50 years' progress?

I think the past half century has developed enough statistics and examples of human progress to permit us to draw back the curtains on the future sufficiently to release our imagination.

So, let's see what our yardstick looks like!

Let's focus our minds back to around 1900. Let's further suppose we are trying to forecast what new commodities we would have today some 50 years later?

Who would have had imagination enough to anticipate the development of automobiles, busses, trucks, airplanes, widespread use of telephones, including trans-continental and inter-continental telephones, air conditioning, washing machines, dishwashing machines, mechanical refrigerators, vacuum cleaners, pop-up toasters, motion pictures with sound and color, radio, television, penicillin, sulfa

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*as presented in sessions of the Metals Section
at the 42nd National Safety Congress*

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Current Safety Topics in the
METAL PRODUCTS INDUSTRIE
AUTOMOTIVE AND MACHINE SHOP INDUSTRIE
POWER PRESS AND FORGING OPERATIONS

*as presented in sessions of the
Automotive and Machine Shop and Power Press Sections
at the 42nd National Safety Congress*

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Acid Handling in the Treble-Super Phosphate Industry

By DUNCAN MacDONALD

Safety Eng., Anaconda Copper Mining Co., Anaconda, Mont.

We are primarily interested in the safe handling of the various types of acid used in the manufacture of treble-super phosphate.

The acids used in this industry are sulphuric acid and phosphoric acid. The H_2SO_4 is manufactured separately in two kinds of plants, a contact acid plant and a chamber acid plant.

The H_3PO_4 is manufactured within the phosphate plant by the addition of H_2SO_4 to the phosphate rock.

There is not space enough to cover the complete flow sheet for either the acid plants or the phosphate plants.

We will cover some of the major safety items concerning the handling of sulphuric acid in the contact plant and then in the fertilizer plant proper.

From the time the gas leaves the roaster building for the contact plant and the finished product, H_2SO_4 is placed into large storage tanks. This process is a sealed or closed unit. In other words, there is no man handling of the acids. However, there are a few items for safety worth mentioning at this time.

In the contact plant most of the acid lines are under pump pressure and when leaks develop in these lines H_2SO_4 is easily sprayed a considerable distance. Certain safeguards must be taken to protect employees. All acid lines in the plant are cast iron pipe connected with cast iron flange type couplings and the couplings are covered with a removable lead housing. This type of flange coupling makes an easier and safer method of replacing, repairing, or cleaning the various acid lines. The lead coverings are placed over the couplings to prevent any spray or leak from the coupling to strike an employee.

Two hydrometers are located close to each other and in the same area close by are a number of valves and acid line couplings. It is necessary for the operator to work close to the hydrometer and to adjust the valves in this area.

A plexi-glass housing was built around these instruments and valves to prevent acid leaks from spraying on the operator.

All adjustments on valves and hydrometers are done from outside the plexi-glass housing. Circular openings with covers that automatically close are placed in the housing. This allows the operator to reach through and adjust the valves or hydrometers with complete freedom from spraying acid. This type of housing also allows complete visual inspection of this area.

In the fertilizer plant proper, the acids used are moved in larger lines, six inches to eight inches in diameter. The acid in these lines moves by gravity. These larger, gravity fed lines have replaced smaller lines which were under pump pressure. By using the larger lines the pressure is much less, therefore there is less danger from acid line leaks. The hazard of spraying is virtually eliminated.

Most of the acids used in the fertilizer plant are sealed within the lines and storage tanks.

However, there are several points in the plant where an employee is working near free acid. Each of these areas are different and special safety regulations are set up.

Where atmospheric conditions are rather damp, goggles are very difficult to wear because of fogging. When this type of conditions exist, eight inch, .030 inch thickness, plastic faceshields are used to replace the goggles. To give proper protection faceshields must be pulled down well over the face. A large, rubber eyecup goggle, with a .030 inch thickness plastic monolens, is used for eye protection where fogging is not a problem.

One of the most prominent hazards in an acid handling plant is the repair of acid lines, acid pumps, and the cleaning and repairing of acid storage tanks. It has been necessary to equip the repairmen with rubber shoes, rubber clothing, rubber gloves, and a complete plastic hood which covers the head, neck, and shoulders. The plastic hood has a large window for complete vision. With this type of protective equipment repairmen have been able to work with comparative safety.

Because of the great amount of corrosion in the plant it has been difficult to paint all

trols and restrictions but rather upon the mining management.

Something must be done to get the attention of the worker in mining safety, create his interest in it, and maintain a firm desire on his part to practice safety. The worker and supervisor alike must realize and believe that the worker is the focal point in the prevention of accidents. Safety person-

nel must sell the idea to the workers themselves that they are the focal point in accident prevention and that safety is not going to be achieved alone or even in large part by laws, decrees, or commands, but by quiet influence, unconscious suggestion, and personal guidance. If these are acquired by the workmen and a safe environment and ample, capable supervision supplied by management, accidents will be fewer and less severe.

The Butte Mines Program

By J. M. HARKINS

Chief Safety Eng., Butte Mines, Anaconda Copper Mining Co., Butte, Mont.

The Butte Mines Department of the Bureau of Safety, which is composed of all members of top management, was organized in the year 1914. It is headed by a chairman and employs a staff of six safety engineers, a chief safety engineer, one clerk, and one staff artist.

Safety engineers are under the direct supervision of the chairman, and are semi-independent of the mine management. This method affords them a free hand in their inspection of the mines, and in the investigation of all accidents.

Safety meetings are held every two weeks for foremen, mine superintendents, assistant general superintendents, and the general superintendent. These meetings are attended by the chairman of the Bureau of Safety and the chief safety engineer.

Safety meetings are conducted at each mine, once a week by the safety engineer and are attended by shift bosses, assistant foremen, foremen, and mine superintendents.

The Bureau of Safety is responsible for the forming of codes and rule books, the creation and circulation of a constant supply of safety posters, bulletins, shift boss information sheets and visual aids, and the presentation of safety incentive awards.

Every year a course in mine safety and accident prevention is conducted, and must be attended by all supervisors from the grade of shift boss up to the general superintendent.

The Bureau of Safety conducts classes each year in first aid to the injured and also in the care and use of oxygen breathing apparatus.

All safety inspections are reported to mine management immediately, and copies are forwarded to the Bureau of Safety where they are studied and filed. Suitable action is then taken with top management in cases that are deemed necessary.

The staff of the Bureau of Safety does not consider their jobs as one of enforcement, but rather as a service department to help the supervisor in his safety efforts because it is sincerely believed that no supervisor wants any man to be injured if it can possibly be avoided.

It is very fortunate that almost every member of top management is a former safety engineer and there is no question of getting the utmost cooperation from these men because the experience gained as a safety engineer follows through when the safety engineer becomes a top supervisor.

As a proof of the effectiveness of these methods, we submit figures that show the results from the year 1916 to the present date. The records prior to 1916 were rather indefinite due to the fact that it was then a pioneering movement, and the records were not kept as they were in later years. Figures show the rate per 10,000 shifts for fatal, serious, and slight accidents combined and goes from a high point of 10.4 to the present 2.3.

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Industrial Hygiene in the Petroleum Industry

By A. C. PABST

Industrial Hygienist, Socony-Vacuum Oil Co., Inc., New York, N. Y.

Industrial hygiene is a field that is closely interwoven with industrial safety. In fact, it can be regarded as a medical engineering phase of safety.

Unfortunately, many people do not know what industrial hygiene is and the functions of an industrial hygienist. The reason for this is that industrial hygiene is a comparatively new science and practically unknown twenty years ago.

Today there are only about 800 industrial hygienists in the United States, and a large number of this group are not in industry, but working for the federal government or state departments. Usually, people hearing the word "hygiene" recall they had a hygiene course in high school which dealt with personal habits such as bathing, cleaning the fingernails, teeth, and so forth and immediately jump to the conclusion that an industrial hygienist in industry must be interested in keeping employees clean.

In my initial visit to many refineries, it seemed that the first place I was taken was to locker rooms to inspect shower and lavatory facilities. In some degree, industrial hygienists are interested in the employee's cleanliness, but only so far as it is necessary to protect his health. We are more interested in keeping an employee's lungs, skin, and other organs clean and free from hazardous gases, liquids, and other harmful substances.

Hygiene is defined as that branch of medical science that relates to preservation of health. Therefore, industrial hygiene may be defined as the science of prevention and control of occupational illness. It resolves itself into the problem of finding factors or conditions in work places that may cause or contribute to the illness or serious discomfort of employees, and of devising methods and means of eliminating or controlling such conditions. Another term that may best describe industrial hygiene might be industrial medical engineering.

The industrial hygienist has done much toward bringing medicine and safety engineering into close cooperation partly because his interests overlap these two fields.

The typical industrial hygienist usually started out as a chemist or chemical engineer who became interested and studied toxicological effects of chemicals on man. Consequently, he has a good background of chemistry and engineering combined with some medical knowledge—a sort of one-third doctor, one-third engineer and one-third chemist. His objectives are protection and improvement of health and safety of workers in industrial environments from all manner of harmful exposures related to occupation.

Industrial hygienists and safety engineers have pretty much the same objectives and should be regarded as members of the same team. Actually, the functions of each are sometimes so inter-related it is not possible to draw a clear line of separation between the two fields, nor is it necessary to do so for if a man's health is endangered by working conditions it is an important part of his safety picture. In many industries, safety and industrial hygiene are combined in the same department.

In the petroleum industry, however, industrial hygienists are usually attached to the medical department and work as closely as possible with the safety department for the protection of the employees. There is good reason why, the petroleum industrial hygienists must lean heavily upon the safety department. In the petroleum industry the concept of industrial hygiene is relatively new as compared to the chemical and other industries, consequently, the number of petroleum industrial hygienists is exceedingly small.

On the other hand, safety departments are well established, well acquainted with and close to every day problems of the petroleum industry. They have considerably more coverage and manpower.

To illustrate, the American Petroleum Institute's roster of safety and fire protection personnel list some 1,200 names, probably not all, in this occupation. Contrasted to this, to the best of my knowledge, there are at present, only 17 industrial hygienists

working for petroleum companies—an industry ratio of approximately 70 safety men to one industrial hygienist. Most of the major oil companies now have at least one industrial hygienist and anywhere from 50 to 100 safety men so you can see it is very necessary for us to work with and through our safety people.

Basically, the practices of industrial hygiene in the petroleum industry is the same as in any other industry and it can be boiled down to four general principles:

1. A knowledge of the toxicology of chemicals and materials.
2. A review of all chemicals or materials used and how handled and tabulation of toxic or potentially hazardous substances.
3. Measurement of worker exposure to hazardous substances.
4. If required, recommendation and installation of adequate control measures and evaluation of the effectiveness of such corrective steps.

Toxicology of Chemicals

In regard to the toxicology of chemicals, it is usually difficult to adequately define a hazardous material because practically anything can be safe or harmful depending upon how it is used or where it is used.

For example, air and water are not regarded as harmful, but both are quite deadly under certain conditions—air if injected into the blood stream and water if introduced into the lungs.

In the same manner, the use of carbon tetrachloride in a process having properly designed ventilation would not be hazardous, while the use of carbon tetrachloride for mopping floors would be quite dangerous. Most safety people are aware that carbon tetrachloride is a hazardous chemical because there has been considerable publicity regarding its toxicological effects, and in some cases, restrictive labeling requirements have been passed, for example, in New York City. Many other chemicals used in the petroleum industry have inherent toxic qualities of the same magnitude, yet are not so well known.

In regard to toxicology, there are three ways in which a substance can cause adverse effects upon man:

1. It can be ingested or swallowed.

2. It can be harmful by direct contact with the skin or parts of the body.

3. It can be inhaled as a gas, vapor, mist or dust.

Ingestion

Fortunately, petroleum materials are not commonly or intentionally taken internally and therefore, trouble from this is rather rare in a refinery, although it does occasionally occur unknowingly. I recall watching a worker who had been complaining of stomach trouble, whose duties involved the compounding of litharge or lead oxide in a doctor solution. This man proceeded to empty bags of litharge into an outdoor mixing tank and because of the dust and mists generated he correctly wore a respirator. Of course, his hands were covered with lead oxide, and to my amazement, the first thing he did when he came down off the catwalk was to take an orange out of his lunch box which he started to peel and eat—probably one of the most effective ways to get lead poisoning.

Unfortunately, when petroleum products get into the hands of customers ingestion is more frequent, usually by small children whose parents carelessly leave products within easy reach. You know that every year there are fatalities reported from children drinking kerosene. We have had hurry calls from doctors involving children drinking such products as penetrating oil and fly sprays.

Some times adults are even worse as there are many cases of anti-freeze poisoning, drinking of brake fluid and one I recall of our radiator flush which contains muriatic acid and chlorinated hydrocarbon. However, this product is fully labeled including poison warning with the skull and cross bones.

It should be emphasized that hardly a substance exists that is not capable of producing effects on the human body if taken in sufficient amounts or under the wrong circumstances. Even common table salt if used in sufficient quantities is toxic. It is reported that many years ago the Chinese used table salt as a means of committing suicide. Every chemical substance, therefore, has a non toxic dose for man and a toxic dose for man. This can be well illustrated by the following slide on a widely used commodity:

Effect of Alcohol Level in Blood*

Ounces of Whiskey Consumed in 1 Hr. or less	Percent Alcohol in Blood	Behavior
1/4	0.01	Normal.
1	0.02	Feeling of warmth pleasant social behavior.
2 - 3	0.05	Judgment blunted. Boastful, impulsive. Officially still sober.
5 - 6	0.1	Fumbling, staggering gait, clumsiness, slurred speech.
8	0.15	Officially drunk. Responses and motor coordination strongly affected.
10	0.2	Helpless, nausea.
16	0.3	Stupor.
24	0.4 - 0.5	Coma.
30	0.6 - 0.7	Paralysis of the respiratory center — Death.

*Pfizer Spectrum, JAMA, March 27, 1954

Skin and Body Contact

Approximately 60 per cent of all complaints received by our department are concerned with dermatitis and skin irritations resulting from contact with petroleum materials.

By far, the majority of these complaints are from customers so this is a subject that is very important in the marketing of petroleum products.

Cases among our employees or in our refineries are few when compared with those among industrial users of petroleum products, and it is believed that the reason for this is due mainly to the degree or extent of contact.

In the petroleum industry skin contact is not generally experienced to the extent that it is—for example, in the metal working industries where a daily eight hour skin contact with cutting oils often takes place.

It is definitely established that skin is not an impermeable barrier to chemical substances, and it is increasingly important as a route of absorption for many materials. Action of chemicals on skin may be local resulting in dermatitis. Examples we are familiar with are kerosene, cutting oils, and so forth, or a chemical may be absorbed through the skin and cause damage to blood or internal parts of the body.

Lead tetraethyl as an illustration does not affect the skin or cause dermatitis but can penetrate the skin and cause internal poisoning.

Regarding external or local skin effects, chemicals may be classified either as primary irritants or sensitizing agents.

A primary irritant is a chemical that may cause dermatitis in individuals frequently after only one contact. They may have a strong chemical action, such as acids, alkalis, amines, and so forth or they may have a weak chemical action but require prolonged contact to cause dermatitis. Most petroleum hydrocarbons are primary irritants but are classed in the latter category in that prolonged or extensive contact is usually required to cause skin irritation.

Sensitizing agents, on the other hand, are chemicals that are innocuous to most skins but capable of producing dermatitis in a few susceptible individuals following repeated contacts over a long period of time. Sensitization may require weeks, months or even years of contact with the material before dermatitis develops.

The petroleum industry is now handling large quantities of chemical additives and inhibitors, many of which are strong primary irritants and very active chemical compounds. By nature, inhibitors usually have to be very potent chemicals because, while they are used in very low concentrations, they exert a powerful influence on the characteristics or performance of the product, and many of the inhibitors are just as potent towards man.

One very active class of inhibitors are the amines and substituted amines, and we are particularly concerned about them because they are very damaging to the eyes, and a splash can readily result in blindness. The amines are usually strong smelling caustic liquids, insoluble in water, hence difficult to remove by washing. They can cause severe eye burns and necrosis of eye tissue. In addition, most amines are readily absorbed through the skin; and even low quantities may cause internal damage and death.

The following will show the effect on skin of one such amine—dimethyl phenylene diamine:

Amount	Skin Area	Effect
0.001cc	1 sq. cm.	Heat — redness — rash
0.005cc	1 sq. cm.	Blister formation
4.0cc	12 sq. in.	Death

Employees should be fully alerted as to hazards of such materials and should be educated to the use of protective goggles, gloves and aprons when handling such products, an activity within the scope of the safety engineer.

The foregoing applies to concentrated or undiluted inhibitors. Finished petroleum

products should and usually do contain such a small quantity, and the inhibitor is so diluted as to result in practically no more harm in the finished product than there would be from the straight mineral oil itself.

Industrial dermatitis cases some times result in bizarre and erroneous conclusions as to their cause even by those who should know better.

I recall a case of a young man who worked in a gasoline station and developed a severe dermatitis. He went to a physician who made patch tests on him and found he had a sensitivity to special gasoline but no reaction to regular gasoline. Apparently, the physician had heard special gasoline contains a lot of lead because the case was diagnosed as resulting from an excess of lead tetraethyl in the special gasoline. We thought this strange because while we all know that lead tetraethyl is a violent poison and can be absorbed through the skin, it is not a primary skin irritant and has never been known to cause dermatitis. A review of records of gasoline shipments into the particular area showed the regular gasoline actually contained the same or some times more lead than the special gasoline, clearly proving that lead tetraethyl was not to blame, but that some other material was responsible.

Inhalation

Of the three avenues by which chemicals can be taken into the body, inhalation probably has received by far the most study and investigation because it is the most important consideration in industrial health.

The vast amount of research on the inhalation of materials has resulted in publication of very useful data on safe human exposure levels known as Threshold Limit Values or Maximum Allowable Concentrations.

This is a list of several hundred commonly encountered chemicals, solvents, dusts, and so forth, the toxicology of which has been carefully studied by medical research and industrial experience.

The list is compiled annually by the American Conference of Governmental Industrial Hygienists and is published by the American Medical Association. It tabulates the maximum amount of the various materials workers can safely be exposed to for an eight hour working day without injury to health.

A few of the materials commonly encountered in the petroleum industry are listed below:

Gases and Vapors	
Substance	PPM
Benzene (benzol)	35
Carbon dioxide	5000
Carbon monoxide	100
Carbon tetrachloride	25
Gasoline	500
Hydrogen sulfide	20
Naphtha (petroleum)	500
Octane	500
Sulfur dioxide	15

Toxic Dusts, Fumes, and Mists	
Substance	Mg. Per Cu. Ft.
Iron oxide fume	15
Lead	0.15
Sulfuric acid	1

Mineral Dusts	
Substance	MPPCM
Asbestos	5
Dust (nuisance, no free silica)	50
Silica	
high (above 50% free SiO ₂)	5
medium (5 to 50% free SiO ₂)	20
low (below 5% free SiO ₂)	50

These values are based on the best available information from industrial experience, from experimental studies, and, when possible, from a combination of the two. They are not fixed values but are reviewed annually by the Committee on Threshold Limits for changes, revisions, or additions as further information becomes available.

Threshold Limits should be used as guides in control of health hazards and should not be regarded as fine lines between safe and dangerous concentrations. They represent conditions only within which it is felt that workers may be repeatedly exposed, day after day, without their health being adversely affected. It is felt, at the present time, that workers should not be exposed to a working environment containing any of these substances in excess of the value indicated.

I cannot over emphasize the importance of the Threshold Limit Values and believe that every safety man should be familiar with them and have copies of the complete table, because they have been incorporated in states' codes and have the force of law in many states, and therefore, must be complied with. So far some nineteen states have written Threshold Limit Values into their laws and often management is not aware of such requirements but would be in a vulnerable position if trouble resulted from excessive exposure to any of the materials. Usually it is up to safety people and indus-

trial hygienists to alert management to the existence of these codes and to institute measures for measurement of air contaminants so as to insure compliance.

Even a common material like gasoline has a maximum safe level which is 500 parts per million. The results of exposure to concentrations greater than 500 ppm is shown by the following:

Gasoline Exposure

Symptoms: Headache, irritation of eyes and throat, dizziness, nausea, loss of consciousness, death.

	Parts Per Million	%
Maximum Allowable concentration for prolonged exposure	500	0.01
Slight symptoms after several hours	1000	0.1
Maximum concentration tolerable for 1 hr.	1000	0.1
Dangerous for short exposure	15000	1.5
Fatal for short exposure	25000	2.5
Lower explosive limit	14000	1.4

Product Labeling

One very important function of the industrial hygienist in the petroleum industry is precautionary labeling of product. This is receiving more and more emphasis as state after state passes labeling regulations. The most recent is the state of New York where the Council on Public Health passed on February 26, 1954 labeling regulations which became effective August 24, 1954 as Chapter IX-A of the New York State Sanitary Code. These labeling regulations have the force and effect of law and require precautionary labeling on any product which entails a hazard in a reasonably anticipated use.

A hazard is defined as—"the risk of injury or illness which may be encountered during or as a result of any reasonably anticipated type of handling or use of a substance, or during its specified use, if any, by reason of the toxicity of the substance through ingestion, inhalation or absorption through the skin, or due to its corrosiveness or irritating properties, or because of its flammability or explosiveness."

Similar labeling regulations already exist in California, Illinois, Oregon, and the Territory of Hawaii and are in the making in New Jersey, New Hampshire, Ohio and Rhode Island. More can be expected. Fortunately, most state regulations are guided by recommendations of the Manufacturing Chemists' Association, Inc. and with some few exceptions, conformity in one state results in conformity in other states.

It is recognized that as a rule labeling regulations of many products are advisable and result in safer handling of the material by customers, but it requires extensive work, knowledge of product and toxicological information to determine what products must be labeled and how they should be labeled. In our company's operations, we use somewhat over 2,000 basic chemicals or raw materials and manufacture some 3,500 finished products which must be reviewed individually in regard to the above.

To illustrate, the following are just a few of the hazardous materials that are encountered in petroleum refinery operations or that might be compounded into finished products:

Materials Encountered in Petroleum Refinery Operations

Respiratory Irritants	Toxic Materials	Skin Irritants
Acrolein	Aniline, liquid	Acids — all kinds
Acetaldehyde	Aniline, dyes	Amines
Aluminum Chloride	Benzol (Benzene)	Benzol (Benzene)
Ammonia	Cadmium	Caustics
Asbestos	Carbon Monoxide	Chromium Salts
Ditertiary butyl para cresol	Chlorinated hydrocarbons	Coal-tar Compounds
Dusts, physiologically inert, general	Chrome compounds	Cobalt, metal and compounds
Dusts, attapulgus clay	Cobalt, metal	Dyes
Dusts, bauxite	Hydrogen sulfide	Inhibitors
Dusts, catalyst	Inhibitors	Nickel salts
Formaldehyde	Lead, metal & fumes	Oils, general
Fluorides	Lead, oxide, litharge	Oils, high boiling from Cat & Steam Cracking
Furfural	Lead, tetraethyl	Oils, insoluble cutting
Inhibitors	Lead, soaps	Phenol
Lime	Manganese	Pitch
Nitrogen oxides	Mercury	Solvents
Ozone	Methanol	Ultra Violet Radiation
Silica	Radioactive materials, general	Wax, untreated
Smoke	Toluol (Toluene)	
Sulfur dioxide	Xylol (Xylene)	
Pine Oil	Zinc	
Welding fumes		

The petroleum industry has made remarkable progress in development of new and better products and in improving processing operations. Accompanying this progress has been new problems of toxicology and health engineering which must be studied and investigated with the same zeal as other types of research.

The advent of catalytic cracking resulted in production and handling of aromatic hydrocarbons, and of importance to us, health problems long associated with the coal-tar industry.

The use of new chemical catalysts, inhibitors, and other chemical compounds involve health problems that chemical industries have faced for years.

To illustrate this trend we need only look at the modern gasolines, fuel oils and motor oils. Years ago motor oils were practically 100 per cent petroleum in nature with little, if any, additives; today they contain up to 15 to 20 per cent of chemicals, additives and inhibitors, and this trend will continue because there is no question that additives necessary and contribute much to improve performance characteristics.

Every step in this direction, however, does pose new problems of health and safety among our plant personnel and our custom-

ers. Because the petroleum industry is becoming more and more involved in the handling of all kinds of chemicals having various degrees of physiological effects upon man, I would like to quote the following concerning chemicals from a publication issued by Du Pont's *Haskell Laboratory of Toxicology*:

"It Takes All Sorts"

"Chemicals, like people, can be mild, fractious and often exasperating. Like people, chemicals are of many types and dispositions. Most are uncomplaining, law-abiding citizens who present no special problems. Some are unstable and unpredictable. Some are out-and-out neurotics, requiring a sharp and observant discipline. Others, harmless by themselves, may be influenced by bad company. Still others are troublemakers in solitary, but docile and helpful in tandem. Some are just plain bad actors."

It is my firm opinion that good industrial hygiene in the petroleum industry is dependent upon combined skills of many and requires earnest cooperation of industrial physicians, industrial nurses, toxicologists, chemists, safety men and industrial hygienists working together as a team. We all have a very important part in the picture.

Safe Handling of Insecticides

By F. R. WILLSEY

Farm Safety Specialist, Purdue University, Lafayette, Ind.

Insecticides are *supposed* to kill! Of course, they are supposed to kill only insects but the fact that they are intended to kill anything at all should be enough to cause us to be alert.

In one sense this problem of "Safe Handling of Insecticides" isn't a new problem at all. For years, we've had insecticides that could and occasionally did kill humans. We have also had some that were less dangerous. On the other hand, in a few short years we've changed from a few old standbys to over 5,000 products involving about 70 chemicals.

Why all this change?

1. Apparently people don't like to eat worms as well as they did. At least public

opinion seems to demand higher quality products now that people realize such products can be produced.

2. And the government doesn't think people should eat so many insects. That's indicated by the fact that we have more laws and regulations governing quality of products, labeling of insecticides, spray residue, and so forth.

3. Insects travel more. They hitchhike rides on the very latest transportation facilities. As a result they get more places and get there quicker than they could a few years ago.

4. New chemicals, plus research, makes new insecticides possible. In fact with each

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cannot be stressed enough. Instruction in proper sleeping, standing, lifting and sitting posture with regular exercises is important in building and maintaining strength and flexibility in the back.

Contrary to popular belief, sitting on the tailbone, with feet propped on a desk, is a good sitting posture. The knees are higher than the hips, which is important when sitting.

The backache problem is increasing in magnitude. As America's working population increases in age, it becomes more and more serious. Everyone concerned must work together. Cooperation is the answer. *Questions from the Floor:*

Q. Is it true that 90 per cent of all backaches in industry are due to constipation, poor posture or foot trouble?

Dr. Stacy: These troubles are indicative of the worker's general physical condition. Back pains are, in the majority of cases, merely a warning sign of a more serious trouble. The important thing is to find the fundamental cause of what is irritating the back to make it hurt.

Q. Do you believe that industry is justified in requiring the applicant to submit to

x-rays as part of the pre-employment examination?

Dr. Stacy: I certainly do. This is merely one forward step in pre-employment screening which is as valuable to the employee as to the employer. The firm is as entitled to know the general physical condition of the applicant as his general appearance and mental aptitude, and x-rays aid in securing this information.

Q. How much should a healthy worker lift?

Dr. Stacy: The weight to be lifted is not important, except for gross abuse. Back trouble usually has built up for many years. It would be ideal for every employee to be kept constantly able in any position to lift 200 pounds but never have to lift more than 150 leaving a 25 per cent safety margin. It is, not unlike a tire, which after so many thousand miles of good service, blows out as it rolls over a pebble. I repeat, thorough pre-employment examinations complete with x-rays; maintenance of strong, straight, mobile back; accurate, qualified diagnosis, and close cooperation among all parties concerned, is the answer to "Industry's Backache."

How the Oil Industry's Fires Occur and Methods for Combating Them

(A Symposium)

Marketing

By JOHN J. JARVIS

Technical Consultant, The Atlantic Refining Co., Inc., Philadelphia, Pa.

I. Basic cause of fire is the combination of flammable vapor and air mixture together with a source of ignition.

A. Basic problem, therefore, is to:

1. Reduce to a minimum vapors in air.
2. Eliminate or control sources of ignition.

II. Specific Hazards in Marketing

A. Bulk Terminals

1. Vapor sources primarily from leaks or venting.

2. Sources of ignition include electrical equipment, hot work, spread-in fires from weeds.

B. Tank Trucks and Loading Facilities

1. Vapor sources primarily from spills and venting.

2. Sources of ignition include electrical equipment, hot engine parts, unauthorized smoking, open lights and possible static discharge.

C. Service Stations

1. Vapors primarily from venting and unauthorized volatile solvents.

2. Sources of ignition are many and difficult to control.

Current Safety Topics in the

**RUBBER
INDUSTRY**

*as presented in sessions of the Rubber Section
at the 42nd National Safety Congress*

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*Past General Chairmen

The last page of the report gives a brief description of the lost time and light work which occurred during the month. This page also gives the standings of the individual teams in the intra-plant supervisory contest.

What do we hope to accomplish through this report? We show the supervisor how his plant and department compare with similar plants and departments on safety. We try to give all the persons credit for a good safety record and for their safety activities. We give the supervisor credit for no lost time accidents, the sale of safety shoes, safety glasses, for making safety contacts and for all the other phases of our program. Likewise when his safety efforts slacken we can point to a number of different items which indicate the need for greater effort.

VI. What Visual Aids Are Used?

A film is shown at nearly every meeting. Most of the films deal with industrial safety-eye protection, foot protection and first aid. We also include films on off-the-safety, such as home and traffic safety.

I feel that a safety meeting should be entertaining as well as instructive. In the fall we show a hunting film and in the spring a fishing film.

Another visual aid which we have used in our meetings is an opaque projector. This projector will show a picture which is six inches by six inches on a screen. Each of

our safety men have a flash camera and take pictures out in the plant. They take pictures of well guarded and unguarded equipment, good or poor housekeeping and safe or unsafe acts of employees. These pictures are thrown on the screen and discussed.

Our conference rooms have black boards which are used to note the standings in our current contests, both national and local. The boards are also used for other pertinent information we wish to discuss in the meeting.

VII. What Have We Learned from Twelve Years of Safety Meetings?

1. The result of interesting meetings is good attendance.

2. The better the room the better the meeting—most of our rooms are air conditioned.

3. Start the meetings on time.

4. Keep the meetings short—never more than one hour, preferably less.

5. Maintain all equipment in good condition and have it set up ready to operate before the meeting.

6. Schedule the meeting each month and let nothing interfere with your meeting.

7. Meeting attendance is better and more is accomplished when "the boss" takes an active part in the meeting.

Short, interesting, well planned safety meetings each month can do much toward making your safety program a real success.

Recent Developments in Calender Safety

By NELSON C. LONGEE

Safety Supvr., Passaic Plant, U. S. Rubber Co., Passaic, N. J.

Most safety engineers are, to quote our good friend Jack Kidney, "nuts about some special feature of accident prevention."

My particular idiosyncrasy happens to be machine guarding. It is based on a firm belief that few other activities offer such opportunities to promote efficient production. I submit that properly developed and production-proved machine guards open up the use of machines to even the least-skilled operator; they permit a wider range of machine use; they often reduce machine abuse; their effect extends beyond the initial pur-

pose to operations and conditions tied in the basic operation; and best of all, they control the frequency and severity of accidents stemming from the hazard they guard because such accidents are largely prevented.

It is natural for men who are greatly interested in some specific field to become specialists—at least in their own opinion.

I do not pretend to be a specialist. Most important, however, is the realization that machine guarding in its greatest dimensions is but a small part of the accident prevention effort; that calender guarding is a still

Safety in the Rubber Industry

(A Round Table Discussion)

Synthetic Rubber and Rubber Laboratories

Presiding: K. B. DAVIS, Supvr., Safety and Training, B. F. Goodrich Chemical Co., Cleveland, Ohio

Recorder: F. T. REYNOLDS, Safety and Personnel Dir., University of Akron Government Laboratories, Akron, Ohio

(14 Participants)

The discussion developed half a dozen recommendations for meeting common laboratory safety problems and suggestions for new section activities. The problem of handling solvents and laboratory equipment was discussed.

It was suggested that a specific manual for each laboratory be used. Several manuals were recommended, among them the National Safety Council's Safe Practices Pamphlet No. 60, "Chemical Laboratories," and the RFC Manual.

It was also recommended that eye protection of some form be used and that special areas for smoking be set aside if they are not already. Most plants do have such areas.

The definition of chemicals is also another problem in most plants. The purchasing department should get information on the toxicity of all new materials to be used and the receiving department should be kept informed of this information.

There were two suggestions for expansion of Section and Council activities. It was urged that the Council encourage the exchange of ideas about associated industries. Reference was made to the synthetic rubber industry's program in Washington.

It was also suggested that safety should be incorporated in the laboratory training of college students. The National Safety Council is the obvious one to sponsor such training.

Automatic Fire Press Safety

Presiding: EDWARD TURNER, Safety Director, the Goodyear Tire and Rubber Company, Ltd., Toronto, Canada

Conference Recorder: W. M. GRAFF, Safety Director, U. S. Rubber Company, New York City

The first subject of discussion was Bagomatic press safety. Bags burst under pressure and operators are burned with scalding water.

Operators are caught in closing presses. While the presses do have a safety bar to prevent the press from closing if someone is in it, the consensus of opinion was that since the danger is so great, regular inspection and testing of the safety devices should be done. It is not enough to just trip the

brake, the entire mechanism should be checked by a mechanic. Sometimes operators try to beat the standard by cutting down on the time cycle. It should be an established rule that is strictly enforced that all operations in the cavity of the press must be completed before the cycle is started. The use of portable extension cords to permit the opening of stuck presses from a distance was also reported and recommended.

Highlights of Recent Revision—Z16.1-1945 Code for Compiling Industrial Injury Rates

By HENRY B. DUFFUS

Administrator, Accident Prevention, Westinghouse Electric Corp., Pittsburgh, Pa.

"The proposed draft of American Standard Z16.1-1945 goes even farther than the present code in providing loopholes whereby a firm or its safety director can obtain salve for a guilty conscience. If the purpose of the code is to assist the boys with the sharp pencil to win awards based on frequency or severity, it serves the purpose well. As safety engineers, the ASSE should promote only those ideas which foster presentation of unvarnished facts and the highest professional ethics. A standard method which is used to compare one organization against another should be as inflexible as possible and not encourage a safety engineer to spend more time looking for loopholes than he spends on looking for accident causes."

That statement is not mine. It is taken from one of the letters that came out of a recent survey made of all ASSE chapters relative to the proposed revision of American Standard Z16.1-1945.

Here is another statement taken from another letter. "If we are going to charge injuries over which the employee or employer did not have control or if neither the employee nor the employer could control the cause of the injury, all the accident prevention activities in the world could not prevent a recurrence, and consequently the effectiveness of the code as a measuring stick of safety is defeated."

Note how diametrically opposed these two viewpoints are. When you do, you begin to realize the terrific problem that has faced us over the past years in our attempts to keep the standard as an accepted method for compiling industrial injury rates.

Background of Industrial Injury Rates

Industrial injury statistics go back as far as 1911 when the International Association of Industrial Accidents Boards and Commissions found a need for standardization. Then after three or four years (1914) they developed Bulletin No. 276 of the Bureau of Labor Statistics. In 1919, the National Safety Council published Safe Practice Pamphlet No. 21.

In 1926 at a national conference on industrial accident prevention the resolution was adopted in favor of a revision of Bulletin No. 276 by the American Engineering Standards Committee, now the American Standards Association. The subject of compiling accident rates was made a part of the task assigned to the committee because of its basic importance from both the scientific and practical points of view. The ground work was laid during the next three years, then after another four years of thorough going over, Z16.1-1937 was born. Incidentally, two members of the original committee, H. W. Heinrich and Paul Dorewiler, are still active members of the present committee.

This new standard established several basic elements of industrial injury reporting: 1) arising out of and in the course of employment; 2) six degrees of injury; 3) basic time charges; 4) frequency, number of injuries per million man-hours and severity, number of days lost per thousand man-hours; and, 5) the disposition of questionable cases was governed by workmen's compensation rulings.

In 1942 a committee was formed to study a need for revision. They quickly put into practice a proposed revision on calendar period changes, thus providing a uniform method of incorporating delayed time charges on late reported cases. In 1945 a revision of the standard was published. The basic changes at that time included divorcing the standard entirely from workmen's compensation rulings. Occupational disease was added. Limitations were put on the reportability of hernias. Common carrier injuries and parking lot injuries were excluded. A 48-hour hospital observation period was added and exception was made excluding fingernails, teeth, disfigurement, and so forth.

The need for revision of this code was apparent within a year after the 1945 revision. In 1947 subcommittees were established to do research work on each of the major sections of the code. As of Septem-

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