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DEPOSITS OF VERMICULITE AND OTHER MINERALS IN THE RAINY CREEK DISTRICT, NEAR LIBBY, MONT.

By J. T. Pardee and E. S. Larsen

SUMMARY

The deposits described are in an easily accessible area about 7 miles northeast of Libby, Mont. They occur in a stock of alkaline rocks that is intrusive into argillite and quartzite of the Algonkian Belt series. About two-thirds of the stock consists of a coarse-grained pyroxenite that ranges from nearly unmixed pyroxene to nearly unmixed biotite or its alteration product vermiculite and generally contains an unusual amount (7 to 10 per cent) of fluorine-rich apatite. In addition, the analysis of a representative sample shows the presence of more vanadium (0.12 per cent V_2O_5) than occurs in igneous rocks generally.

The remainder of the stock is coarse-grained syenite composed chiefly of intergrown potash and soda feldspars (microcline microperthite) and altered nepheline syenite composed chiefly of microperthite and nests of secondary muscovite. Near the main igneous body is a dike of fresh nepheline syenite.

Widespread and unusual changes in the stock have been caused by hydrothermal action. The principal minerals thus produced are white mica, aegirite and aegirite-diopside (both locally vanadiferous), vermiculite, and fibrous amphiboles. Locally titanite and feldspars are developed and also veins containing a variety of minerals.

A large body of the vermiculite is being developed commercially by the Zonolite Co. In addition several smaller bodies are being explored by the Vermiculite & Asbestos Co., and in some of these bodies the mineral makes up from 30 to 84 per cent of the pyroxenite country rock. Vermiculite is comparatively new to commerce. It is a micalike mineral containing a large amount of water. Upon being heated it expands enormously and assumes golden or silvery lusters. The expanded material is so light that it floats on water. It appears to have a low heat conductivity and to resist high temperature. The Zonolite Co. reports 1,500,000 pounds mined and sold under the trade name "Zonolite." The uses of zonolite include fireproof roofing, wall board, and similar material, packing for refrigerators, sound-deadening plasters, boiler covering, electrical insulation, and wall-paper decoration.

On the spur north of Kearney Creek much of the pyroxene of the large pyroxenite body has been altered to amphibole of a fibrous habit that is known commercially as amphibole asbestos. Bodies of a dikelike form 14 feet or less in width consist of nearly unmixed amphibole asbestos (near tremolite), and in several places this substance composes from 50 to 75 per cent of the country rock. A small amount has been mined for experimental purposes, but no commercial production is reported. The material near the surface is rather easily

separated or fiberized. The fibers are weak and inelastic, but they compose a fluffy mass that to all appearances is similar to the ordinary run of amphibole mass fiber.

The syenite body contains large masses of nearly unmixed alkaline feldspar, but whether its quality is such as is required in the ceramic or other industries has not been determined.

Veins that occur in the pyroxenite mass contain—in addition to quartz—chalcopyrite, galena, sphalerite, fluorite, strontianite, celestite, aegirite, aegirite-diopside, and other minerals. Samples of the aegirites showed the presence, respectively, of nearly 4 per cent and nearly 3 per cent of vanadium oxide (V_2O_3). A sample of a part of one vein contained about 2 per cent of copper.

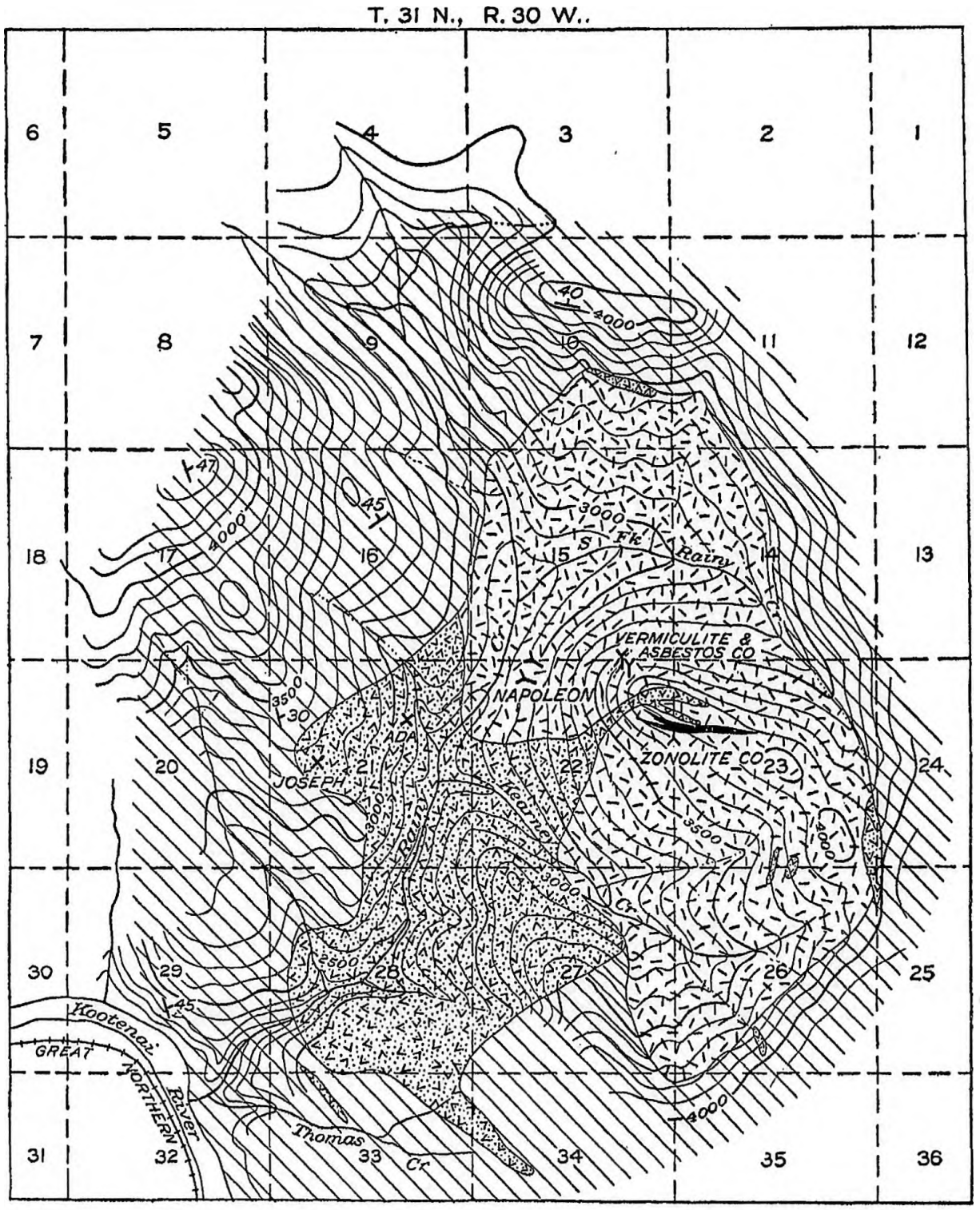
INTRODUCTION

The deposits described herein have been visited by the writers at different times between 1911 and 1927. During the earlier part of that period quartz lodes along Rainy Creek were being developed by B. M. Thomas, since deceased, whom the writers hold in grateful recollection for aid and courtesies extended to them in the field. The specimens collected at that time included several unusual and interesting kinds of rocks and minerals. Analyses of some of them in the laboratory of the United States Geological Survey showed, among other things, the presence of considerable vanadium, on which a report was published.[1] After the death of Mr. Thomas several years ago development work ceased for a time. During the World War the demand for steel-hardening metals directed the attention of E. N. Alley, of Libby, to the area as a possible source of vanadium. While searching a small tunnel for ores of that metal he observed that the flakes of a coarse micalike mineral in the walls swelled enormously when heated by the flame of his candle. The flaky mineral proved to be vermiculite, and further examination showed it to be present in great quantities. Since then Mr. Alley and others, incorporated as the Zonolite Co., have developed this unique deposit and built a plant at Libby to convert the crude vermiculite into the product which they call "zonolite." More recently several companies have been formed to exploit other deposits in the same area.

GEOGRAPHY

The area under consideration is the lower part of the basin of Rainy Creek, about 7 miles northeast of Libby, Mont. (See pl. 1.) It is easily reached from the main automobile highway along the north bank of the Kootenai River by a short branch road up Rainy Creek. The Great Northern Railway approaches within 2 miles, but it lies on the opposite bank of the river. A few miles below Rainy

[1] Larsen, E. S., and Hunt, W. F., Two vanadiferous aegirites from Libby, Mont.: Am. Jour. Sci., 4th ser., vol. 36, pp. 289–296, 1913.



Contour interval 100 feet
Datum mean sea level

EXPLANATION

- Biotite rock (Altered to vermiculite)
- Syenite
- Pyroxenite
- Belt series (Argillite, quartzite, and limestone)
- Strike and dip
- Adit
- Prospect

GEOLOGIC MAP OF THE RAINY CREEK DISTRICT, T. 31 N., R. 30 W., MONTANA

Creek, however, a logging railroad crosses to the north bank. The name Rainy Creek is said to be a corruption of Rennie Creek, the stream having originally been named after a prospector, John Rennie, who explored its basin about 40 years ago.

For a mile above its mouth the valley of Rainy Creek is narrow and steep-sided. Farther up it is wider and its bordering slopes gentle. This upper stretch, together with several small branch valleys, forms a basinlike depression surrounded by mountains 1,000 feet or more high. Within it the local relief ranges from 500 to 1,000 feet. The altitude at the mouth of Rainy Creek is somewhat less than 2,100 feet, and the ridges surrounding the basin reach 4,500 feet or more.

GEOLOGY

BELT SERIES

The Rainy Creek basin is underlain chiefly by argillite and quartzite that apparently are the equivalents of the rocks exposed along the Kootenai River west of Libby described by Calkins[2] as follows:

Summary of section in gorge of Kootenai River between Troy and Libby, Mont.

	Feet
Argillite, greenish gray and dark blue, finely laminated, not continuously exposed	4,300
Quartzite and indurated sandstone and shale, reddish purple and green	1,250
Argillite grading into sericitic quartzite, mainly green, but with purple strata interbedded	1,400
Argillite, siliceous, greenish gray, in part somewhat calcareous and weathering to a yellow color; dip flat, about	1,000
Limestone, cream-colored, weathering somewhat yellow, with some partings of green argillite, exposed near Kootenai Falls	30
Shale, indurated, and shaly limestone and quartzite, purple and gray-green, with some calcareous bands	600
Argillite, mostly greenish gray, weathering yellow as if calcareous, sun-cracked and ripple-marked	3,200
Argillite, purple	5
Argillite, gray-green	100
	11,885

No detailed examination of these rocks was made in the Rainy Creek area, but in general they exhibit moderately steep dips and open folds that trend northwestward. Near the borders of the intrusive stock described farther on the argillite is altered to a faintly banded hornstone; elsewhere the rocks show the effects of regional metamorphism only. They doubtless belong to the Algonkian Belt series.

[2] Calkins, F. C., A geological reconnaissance in northern Idaho and northwestern Montana: U. S. Geol. Survey Bull. 384, p. 76, 1909.

PORPHYRY

Small dikes of a rather dark gray rock that is classified as quartz latite porphyry are apparently the oldest intrusive rocks present. They penetrate the Belt series in many places, but none were seen cutting the other igneous rocks. They consist of phenocrysts of white feldspar (plagioclase) in a fine-grained groundmass made up of quartz, feldspars (orthoclase, plagioclase), and alteration products, including epidote, sericite, chlorite, calcite, and biotite.

INTRUSIVE STOCK

A stock of alkaline rocks intrusive into the Belt series underlies an area of about 6 square miles in the basin of Rainy Creek. (See pl. 1.) It is composed of pyroxenite and syenite and their alteration products; the pyroxenite is the older of the two. These rocks, especially the pyroxenite, are much less resistant to weathering and erosion than the surrounding Belt rocks, and a basin has, therefore, developed in them.

Pyroxenite.—A coarse-grained pyroxenite composes about two-thirds of the stock. It is a soft dark-green rock that forms the gentler slopes and offers few natural outcrops. In most places the rock is so friable that it can be crushed to a sand by squeezing in the hand. In mining operations holes for blasting commonly can be made in this rock with an ordinary auger.

In mineral composition the rock ranges from nearly unmixed pyroxene to nearly unmixed biotite or its alteration product vermiculite. Apatite high in fluorine commonly makes up 7 to 10 per cent of the rock, which therefore is the richest in apatite among all the large bodies of rock known to the writers. Feldspar (microcline microperthite) occurs in amounts as much as 15 per cent of the mass. The accessory minerals are chiefly magnetite (or ilmenite) with rarely titanite and garnet.

As shown by the analysis of a representative sample taken from a tunnel on the Napoleon claim, the pyroxenite is composed chiefly of the silicates of iron, calcium, and magnesium. The rock contains proportionately less silica and magnesia and more iron and lime than most pyroxenites. It is high in phosphorus and fluorine; these elements together with much of the excess of lime are contained in the apatite previously mentioned. An unusually interesting feature is the presence of a noteworthy amount of vanadium.[3] The complete analysis follows:

[3] Larsen, E. S., and Hunt, W. F., op cit., p. 293.

Analysis of pyroxenite from Rainy Creek, Mont.

[Analyzed by George Steiger in the laboratory of the U. S. Geological Survey. Nickel not tested for. Specific gravity, 3.417, measured on a full-sized hand specimen]

	Per cent		Per cent
SiO_2	37.47	CO_2	0.36
Al_2O_3	2.86	P_2O_5	4.33
Fe_2O_3	11.77	S	.04
FeO	7.83	F	.36
MgO	10.12	V_2O_3	.12
CaO	21.68	MnO	.16
Na_2O	.47	BaO	.06
K_2O	.93	SrO	.14
H_2O-	.27		100.77
H_2O+	.73	Less O	.02
TiO_2	1.07		100.75
ZrO_2	None.		

Syenite.—About one-third of the Rainy Creek stock consists of syenite, the main body of which occupies an area of about 2 square miles in the southwestern part. In addition many small bodies of syenite cut the pyroxenite, only the larger of which are indicated on the map. Much of the syenite is variable in texture, and the mass is probably made up of several separate but related intrusive bodies.

The rock of the main body is medium to coarse grained, nearly white where fresh but iron stained on weathered surfaces. It is composed chiefly of intergrown potash and soda feldspars (microline microperthite), with about 15 per cent of secondary muscovite in coarse plates. Accessory and secondary minerals, which as a rule are present in small amounts, include dark hornblende, fluorite, apatite, titanite, rutile, biotite, and garnet.

The dikelike body that projects into the ridge north of Kearney Creek is a medium-grained greenish-gray to nearly white rock with numerous streaks and bunches of a darker color. It is also made up chiefly of microperthite. The darker parts are rich in pyroxene and titanite. A dike of syenite at the northern extremity of the stock is opened for nearly 100 feet by a tunnel. This rock is giant grained and composed mostly of intergrown potash and soda feldspars (perthite) cut by very numerous veinlets of green pyroxene (diopsidic aegirite).

South of the stock in the Belt rocks, on the ridge north of Thomas Creek, is a small dike of nepheline syenite. This rock varies irregularly from fine to coarse grained, and the coarser grains have diameters as great as 7 inches. It is composed chiefly of the soda feldspar albite, the closely related mineral nepheline, and the potash feldspar microcline in nearly equal amounts. In addition there are small amounts of aegirite, apatite, and magnetite and secondary fluorite

and zeolites. In the hand specimen the rock is seen to consist mainly of white feldspar. The nepheline occurs in crystals several inches across, which on account of their brown tint and greasy luster show plainly in contrast with the porcelain-like feldspar.

GRANITE AND MONZONITE

A few small dikes of nearly white granite cut the Belt rocks, and one such dike a few inches wide was observed to penetrate the syenite. The rock is composed mainly of feldspar and quartz with small amounts of pyroxene, apatite, titanite, fluorite, and magnetite. On the Ada claim a small dike that cuts the pyroxenite shows small porphyritic crystals of feldspar and green hornblende in a fine groundmass. It is to be classified as quartz monzonite porphyry.

HYDROTHERMAL METAMORPHISM

Changes in the stock by the action of hot solutions have been so widespread and so unusual in character as to deserve special notice. The principal minerals produced by these changes are white mica, aegirite, aegirite-diopside (both locally vanadiferous), vermiculite, and fibrous amphiboles. Locally titanite and feldspars are developed, and also quartz veins containing chalcopyrite, pyrite, galena, sphalerite, strontianite, and other minerals. In the following pages the present or prospective economic value of several of the minerals is discussed.

MINERAL DEPOSITS

VERMICULITE

Character.—The vermiculites are micalike minerals that give off much water when heated and therefore exhibit the physical character of exfoliation. Some kinds are described as slowly opening out into long wormlike threads, hence the group name. Dana[4] lists more than a dozen varieties of vermiculite from different places. The variety from West Chester, Pa., called jefferisite resembles the vermiculite from Rainy Creek more closely perhaps than any of the others. Dana describes it as occurring

> in broad crystals or crystalline plates. Surface of plates often triangularly marked by the crossing of lines at angles of 60° and 120°. Cleavage: Basal, eminent. Flexible, almost brittle. H.=1.5. G.=2.30. Luster pearly on cleavage surface. Color dark yellowish brown and brownish yellow; light yellow by transmitted light; also greenish yellow.

General occurrence.—Vermiculite is a constituent of some altered igneous rocks, and it generally occurs mixed with other minerals and

[4] Dana, J. D., The system of mineralogy, Descriptive mineralogy, 6th ed., pp. 664–668, New York, John Wiley & Sons, 1909.

thus distributed through the rock mass. In a few places, however, it is found in almost clean or unmixed bodies large enough to mine. Bodies that have a dikelike form and range from 1 to 6 feet in width are reported from North Carolina. So far as known no commercial use has been made of them. A deposit in Chaffee County, Colo., is described by Sterrett[5] as follows:

> A hydrated form of biotite mica found about 5 miles southeastward of Hecla, in the Turret mining district, has been used in the industries during the last few years. The material is mined and handled under the name of tung ash by the Denver Mining & Manufacturing Co. By calcining the mica as it comes from the mines and then crushing and sizing, a ground product with a rich golden-bronze to silver color and metallic luster is obtained. This is suitable for various decorative purposes. Because of the expansion and exfoliation the mica undergoes when calcined a little of the crude product will make a large quantity of the calcined product. The finished tung ash is light, and a small quantity will spread over a large surface.
>
> According to Mr. W. W. Kirby, secretary of the company, the mica is found in veins that lie between gray granite and hard black schist and that reach in places a thickness of 4 feet. It occurs in shoots about 40 feet long, very much like ores in metalliferous veins, and forms solid masses of crystals, the largest 2 or 3 inches in diameter, bunched together at different angles. In the parts between the ore shoots a similar variety of mica forms about 50 per cent of the filling. The mica is greenish to brownish black. The folia are flexible and inelastic. When heated they swell and exfoliate vary much like vermiculite. The laminae of the calcined product are sufficiently separated and brittle to break down into a fine scaly product, which exhibits the colors and luster already mentioned.

Deposits of vermiculite in the Turret district, 14 miles north of Salida, 9 miles from Iola, Gunnison County, and at Westcliffe, Custer County, Colo., are described briefly by Alderson.[6] The largest of these deposits, the one at Westcliffe, has a maximum width of more than 13 feet and is more than 30 feet long.

Occurrence in the Rainy Creek district.—A body of vermiculite in the Rainy Creek district that is being developed by the Zonolite Co. on the spur north of Kearney Creek is much larger than any deposit heretofore known. It presents no natural exposures, but its outcrop and the slopes below are mantled with a yielding slippery soil composed chiefly of micalike flakes. As incompletely shown by the workings so far made, this body appears to be of dikelike form and at least 100 feet wide and 1,000 feet long. It extends to a depth of more than 100 feet, its lower limit not being shown. Several smaller bodies of vermiculite occur in the ground of the Vermiculite & Asbestos Co. on the northwest slope of the same spur. There a

[5] Sterrett, D. B., Mica deposits of the United States: U. S. Geol. Survey Bull. 740, p. 50, 1923.

[6] Alderson, V. C., Jefferisite, Colorado School of Mines, no date.

tunnel penetrates six bodies that range from 1 to 4 feet in width. They are of flat lenslike or tabular form, and most of them are definitely separated from the wall rock by fault or slip planes. Incomplete exposures of several other similar bodies are made by smaller workings.

The vermiculite is an alteration product of biotite and locally is one of the main constituents of the pyroxenite mass. In open cuts and tunnels that are scattered over the upper part of the spur north of Kearney Creek it appears generally to make up 30 per cent or more of the rock. Samples representing areas of several square feet at different places in the workings of the Vermiculite & Asbestos Co. contained from 30 to 84 per cent of vermiculite. Apparently there is a huge amount of such mixed material.

No analyses showing the chemical composition of the vermiculite from Rainy Creek are available. Specimens from different places described by Dana[7] are all hydrated silicates of magnesium and aluminum containing more or less iron.

Production and uses.—As an economic product vermiculite is comparatively new. An unknown but probably small amount has been mined in Colorado. In the Rainy Creek area near Libby, Mont., the Zonolite Co. reports 1,500,000 pounds mined and converted into the heat-expanded product zonolite and 100 tons sold in the crude form. Prices range from $10 or less a ton for the crude vermiculite to $20 or more a ton for zonolite. The most striking features of the vermiculite from Rainy Creek are its properties of expanding enormously when heated and at the same time assuming golden or silvery lusters. The expanded material floats on water and is nearly as light as cork. It appears to have a very low heat conductivity and to be capable of resisting high temperature. These qualities at once suggest it to be useful for heat and cold insulation and similar purposes. Uses reported by the Zonolite Co. include fireproof roofing, plaster, and wall board, packing for safes and refrigerators, acoustic and sound-deadening plasters, pipe and boiler covering, electrical insulation, and wall-paper decoration.

FIBROUS AMPHIBOLES

Locally the pyroxene (diopside) of the large pyroxenite mass has been changed by hydrothermal metamorphism to an amphibole of fibrous habit, related to tremolite. The minerals known commercially as amphibole asbestos are more or less useful, their value depending on their quality and the relative location of the deposits. Amphibole asbestos is found in many places in the Appalachian and

[7] Dana, J. D., op. cit., p. 665.

western mountain regions. Usually it is associated with igneous rocks and occurs as veins and bodies of dikelike form. The principal bodies that have been worked are in Georgia. In recent years small amounts have been mined in North Carolina, Virginia, and Maryland. Little is known of the deposits in the Western States, except one near Kamiah, Idaho, which is described by Diller[8] as including half a dozen ledges within a few square miles. The largest of these ledges is lenticular in form, about 200 feet long and 40 feet wide.

In the Rainy Creek district in Montana the workings of the Vermiculite & Asbestos Co. expose several bodies of amphibole asbestos which are of dikelike or tabular form and of different widths. The largest, as exposed by open cuts, appears to be 100 feet or more long and from a few feet to 14 feet wide. A body 4 feet or more wide exposed in the face of a tunnel at a depth of 150 feet may be the downward continuation of the same deposit. Several smaller bodies are exposed in other workings. Samples representing the different bodies show the amphibole to be mixed with 1 to 10 per cent of other minerals, chiefly vermiculite and unaltered pyroxene. In other places the country rock is particularly rich in amphibole. A sample across a width of 16 feet of the rock as exposed by a short tunnel contains, in round figures, 75 per cent of amphibole, 15 per cent of pyroxenite and apatite, and 10 per cent of vermiculite. A sample representing another body 50 feet wide consists of 50 per cent of amphibole, 30 per cent of pyroxenite, and 20 per cent of vermiculite.

In several places elsewhere on the spur north of Kearney Creek the pyroxenite appears to be comparably rich in fibrous amphibole. Doubtless, if necessity arose, the fibrous mineral could be separated from the other rock constitutents, and in that event the richer parts of the pyroxenite mass might be the source of a very large amount of the fibrous mineral.

As commonly understood, the term asbestos embraces the fibrous varieties of several minerals, including anthophyllite, tremolite, actinolite, and crocidolite, which belong to the amphibole group, and chrysotile, a variety of serpentine. The usefulness of these minerals depends on their resistance to heat and the strength and flexibility of their fibers. All the varieties mentioned except crocidolite are about equally resistant to heat.

The tremolite and anthophyllite asbestos are more resistant to acids than chrysotile and crocidolite, but in flexibility and strength of fiber chrysotile and crocidolite are far superior to the others. The

[8] Diller, J. S., U. S. Geol. Survey Bull. 470, pp. 519, 520, 1911.

asbestiform minerals are classified also as cross fiber and slip fiber, according to whether the fibers are crosswise or parallel to the walls of the body. Mass fiber is the name applied to material in which the fibers or groups of fibers stand at various angles. Most of the chrysotile and the better or more valuable grades of amphibole asbestos occur as cross fiber in narrow veins that compose but a small part of the rock removed in mining. The cheapest grades of asbestos are mass-fiber amphibole, which, however, is commonly found in bodies of fairly large size.

The annual production of amphibole asbestos in the United States from 1915 to 1925, as reported in the volumes of Mineral Resources, has ranged from 42 to 1,415 tons. The average price during the same period ranged from $8 to $160 a ton. In 1922, when the last-mentioned price was attained, the amount produced was only 42 tons, most if not all of which was a high-grade cross fiber from Pylesville, Md. The years of low price were years in which the production increased and was made up chiefly of mass-fiber anthophyllite. As some of the more valuable cross fiber is included in the total amounts reported, the price of mass fiber in 1925, for example, must have been somewhat less than $9 a ton.

The bulk of the amphibole asbestos produced in recent years in the United States has come from Georgia. Small amounts have been reported from Maryland, Virginia, North Carolina, California, and Washington. The deposit near Kamiah, Idaho, previously mentioned, has been operated intermittently since 1916, small shipments being made in 1917 and 1925. Most of the product reported has been used as a constituent in millboards, roofing, flooring, plasters, cements, paint filler, pipe coverings, and similar articles. A small part has been used for making chemical filters, for which, as already explained, the amphibole varieties, because of their resistance to acids, are particularly well suited. However, material for this purpose must be exceptionally clean and free from impurities of any sort, and in general its value for any purpose varies according to the strength and separability of its fibers. A small amount of amphibole asbestos has been mined in the Rainy Creek district for experimental purposes, but no commercial production is reported.

The asbestos from Rainy Creek is related to tremolite, but the presence in it of considerable soda and ferric iron suggests that it will be less resistant to heat than the true variety of tremolite. Near the surface the asbestos is rather soft and easily separated or fiberized. The fibers are weak and inelastic and break into short pieces, but they compose a fluffy mass that to all appearances is similar to the general

run of amphibole mass fiber. Samples from places not affected by weathering consist of rather harsh fibers that are not so easily separated as those in the weathered material. To obtain a usuable product more or less impurities would need to be separated from all the bodies that were seen. The value of the Rainy Creek deposits apparently depends on the development of near-by markets.

FELDSPAR

Most of the large mass of syenite in the Rainy Creek district is of fairly uniform composition. It is made up chiefly of alkaline (potash-soda) feldspars with about 15 per cent of white mica (muscovite) in aggregates of coarse plates. Ferromagnesian minerals are almost entirely absent, but some magnesia is present in the mica, and a little iron is indicated by the characteristic stain.

In the United States considerable alkaline feldspar is used in making pottery, chinaware, porcelain, and other ceramic products. Most of the quarries are near the eastern seaboard, where feldspar deposits are locally abundant and where the ceramic industries are concentrated. A few are in California. The value of any deposit depends on its accessibility, nearness to markets, size, and quality. The body at Rainy Creek is of large size, but whether its quality will meet economic requirements has not been determined. It is easily accessible, but it is rather distant from established markets.

COPPER, LEAD, ZINC, AND VANADIUM

Veins that are found chiefly in the pyroxenite area were partly explored several years ago, as mentioned on page 18, in a search for metalliferous minerals. One of the veins, which is developed by some short tunnels and shafts on the Napoleon and Copper Antler claims, is about 10 feet wide. The middle part is chiefly quartz with scattered grains of galena and chalcopyrite. Next to the walls are zones a few inches wide made up chiefly of vanadium-bearing aegirite, microcline, strontianite, celestite, pyrite, and chalcopyrite with smaller amounts of quartz, fluorite, galena, and sphalerite. A representative sample of one of the zones, analyzed by R. C. Wells in the laboratory of the United States Geological Survey, contained 1.92 per cent of copper.

The vanadiferous aegirite is the most conspicuous mineral of the zones. It occurs as black needles as much as half an inch long that project from the walls and also form radiating nodules or spherulites embedded in the other minerals. An aegirite-augite (diopside) occurs

also in veinlets in the form of nodules an inch or less in diameter composed of fine radiating fibers. The composition of these two pyroxenes is as follows:

Analyses of vanadiferous aegirite and aegirite-augite from the Rainy Creek district, Montana

[Analyzed by W. F. Hunt in the laboratory of the U. S. Geological Survey]

	Aegirite	Aegirite-augite		Aegirite	Aegirite-augite
SiO_2	51.01	53.32	Na_2O	10.46	6.26
TiO_2	.91	.88	K_2O	.22	.26
Fe_2O_3	21.70	12.38	Cr_2O_3	----------	Trace.
V_2O_3	[a] 3.08	[b] 2.86	H_2O-	.06	.07
Al_2O_3	.38	1.40	H_2O+	None.	.13
CaO	5.53	12.18	S	.13	----------
MgO	3.08	7.01	CO_2	Trace.	----------
FeO	1.48	3.70		100.51	100.40
MnO	.58	.45			

[a] A duplicate sample gave 3.81 per cent. [b] A duplicate sample gave 2.82 per cent.

For a few inches on both sides of the veins the pyroxene of the wall rock is changed to a fibrous amphibole related to actinolite and glaucophane. Some calcite, pyrite, and chalcopyrite are present in the altered rock, and locally there are sulphides and large amounts of quartz. On the Joseph claim a small vein that cuts the syenite consists of quartz and a little chalcopyrite and its oxidation products. The nepheline syenite dike south of the main syenite body is also cut by a quartz vein that shows a little pyrite and galena. Several small quartz lodes occur in the belt of slightly metamorphosed sedimentary rocks surrounding the intrusive stock. One of these lodes near the nepheline syenite dike on the divide north of Thomas Creek consists chiefly of quartz and fluorite that are stained green with copper carbonates. Others farther northwest, near Rainy Creek, show copper-stained quartz. A few that were observed west and north of the intrusive mass showed quartz only.

Although they are of unusual interest for their mineralogy, the veins are probably not rich enough in materials of economic value to be worked under present conditions.

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PROCEEDINGS

OF

All Ohio Safety Congress

Held Under the Auspices of
THE INDUSTRIAL COMMISSION OF OHIO
and direct management of
THE DIVISION OF SAFETY AND HYGIENE

Published under the authority
of
The Industrial Commission of Ohio

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Joseph Zucker, Cleveland Plain Dealer, Cleveland, Ohio.

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Exhibit

Chairman: Buell W. Nutt, President, Safety Equipment Service Company, Cleveland, Ohio.

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Leslie L. Diehl, Secretary, Dayton Safety Council, Dayton Chamber of Commerce, Dayton, Ohio.

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14–15	Acme Safety Products Co., Akron, Ohio.
23	American Abrasive Metals Co., Irvington, New Jersey.
22	American Mat Corp., Toledo, Ohio.
4–5	E. D. Bullard Co., Chicago, Illinois.
10	The Dilley Mfg. Co., Cleveland, Ohio.
19	The C. P. Dolge Co., Westport, Conn.
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16–17	Kimball Safety Products Co., Cleveland, Ohio.
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29	The Lindsey Sanitation Co., Cleveland, Ohio.
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1	Safway Steel Scaffold, Inc., Detroit, Mich.
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3	The Surty Mfg. Co., Chicago, Illinois.
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26	The Geo. L. Williams Co., Cleveland, Ohio.

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56	Bausch & Lomb Optical Co., Rochester, New York.
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32–33	Helmerichs Supply Co., Cleveland, Ohio.
20–21	Industrial Commission of Ohio, Columbus, Ohio.
38	Iron Age Division, H. Childs & Co., Inc., Pittsburgh, Pennsylvania.
43–44	Walter G. Legge Co., Inc., New York, New York.
29	Lehigh Safety Shoe Co., Inc., Allentown, Pennsylvania.
49–50	Metropolitan Life Insurance Co., New York, New York.
35–36–37	Mine Safety Appliances Co., Pittsburgh, Pennsylvania.
45–46	The M. F. Murdock Co., Akron, Ohio.
68	Oil-Dri Corp. of America, Chicago, Illinois.
53–54	The Patent Scaffolding Co., Inc., Chicago, Illinois.
57–58	Safety Clothing & Equipment Co., Cleveland, Ohio.
31	Safety Engineering Magazine, New York, New York.
73–74	Safety First Supply Co., Cleveland, Ohio.
25–26	Standard Safety Equipment Co., Cleveland, Ohio.
55	The Steel Scaffolding Co., Inc., Brooklyn, New York
30	Sugar Beet Products Co., Saginaw, Michigan.
34	Thom McAn Safety Shoe Division, New York, New York.
24	West Disinfecting Co., Cleveland, Ohio.
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Official Program

TUESDAY MORNING, APRIL 16

EIGHT A. M.
All Sessions Will Convene on Eastern Standard Time
Registration—Mezzanine Floor

No Charge for Registration

GENERAL SESSION
NINE-THIRTY A. M.
Ball Room

Chairman—G. L. Coffinberry, Chairman, Industrial Commission of Ohio.
Song—"America"

Invocation:
Rev. D. S. Mills, Pastor, Avondale United Brethren Church, Columbus.

Dedication:
His Excellency Frank J. Lausche, Governor of Ohio.
Song—"My Ohio"

Welcome to City:
Honorable James A. Rhodes, Mayor of Columbus.

Remarks:
Harry L. Sain, Superintendent, Division of Safety and Hygiene.
Solo—Leslie L. Diehl
Group Singing—Led by Leslie L. Diehl
Accompanist—Norman Jones

Inspirational Address:
Theo. F. Smith, President, Oliver Iron and Steel Co., Pittsburgh, Pa.

TUESDAY AFTERNOON

SECTION MEETINGS
CERAMICS
TWO P. M.
Room 250—Neil House

Chairman—F. W. Gunther, Universal Sewer Pipe Co., Cleveland, Ohio.

Vice-Chairman—J. R. Westbrook, Shawnee Pottery, Zanesville, Ohio.

2:00 P. M.—Opening Remarks by F. W. Gunthor, Chairman.

2:15 P. M.—"Methods and Equipment for Dust Control"; Illustrated) Harry O. Danz, Manager Dust Control Division, American Blower Corporation Detroit, Michigan.

3:15 P. M.—"Personal Protective Equipment";
George Lascher, Mine Safety Appliances Co., Pittsburgh, Pensylvania. Mr Lascher will show the new respirator movie "The Air We Breathe".

4:00 P. M.—Discussion Period.

METALS SECTION

Tuesday Afternoon Session, April 16, 1946

This session of the Metals Section of the All Ohio Safety Congress was called to order at two o'clock by Mr. A. B. Waugh, Otis Works, Jones & Laughlin Steel Corporation Cleveland, Ohio, Chairman.

Chairman Waugh: I think that a good many of you fellows probably feel the same way I do about resuming these annual meetings here in Columbus. There were a number of regional conferences held throughout the State, which were very fine. We enjoyed the one in Cleveland very much, but I have always looked forward to coming down here and renewing old acquaintances and swapping ideas with people that you meet over a period of time, and I think that anyone who is attending for the first time will find that it is a very enjoyable affair and very beneficial.

Ever since our first speaker accepted this chore I have been waiting expectantly to hear him talk. He certainly has a reputation, and the first one to express his views on that subject was Harry Sain, and I think Harry ought to be a good judge of a good speaker, and I think that we really have a treat in store for us.

Mr. R. J. Greenly, who is Manager of Personnel Administration for the Jones & Laughlin Steel Corporation at Pittsburgh, has done various things in his life. He sort of analyzed them in this way for me. He said he has proceeded on a tradesman, a mechanic, foreman, superintendent and educator.

He also gave me a rather nice outline of how to introduce his subject, but I am a little bit afraid I will gum it up. It is a swell idea. I will read the outline to get some idea of what he has in mind.

I wish he would make his own introduction, in fact. No. 1 point is, why this particular subject that he is discussing? He will probably cover that pretty thoroughly.

The second one is why do we have such a particular talk before this audience? He will probably tell you that, too.

Three, why is it particularly pertinent at this particular time? The subject that he is dealing with is pertinent at any time and probably just as much so now as ever and, fourth, is why did we pick this particular speaker to do the job?

Well, as I said before, he has got a reputation and he better live up to it.

I think that at this stage I had better ask Mr. Greenly to come up and give us proof of this reputation, and I really think he can do it. Mr. Greenly.

THE RESPONSIBILITY FOR SAFETY

Mr. R. J. Greenly, Personnel Relations Department,

Jones & Laughlin Steel Corporation, Pittsburgh, Pennsylvania.

Mr. Chairman and Gentlemen:

I am somewhat reminded of a story that is reminiscent of this presentation. I recall last evening when Frank Kelsey and I were at the hotel. We visited the banquet that was given in this same room, and I recall the experiences I had with you a few years ago, at which time I was then affiliated with Purdue University, and have looked forward with anticipation to a return engagement.

As I was visiting with friends of mine at the banquet last evening the story that I recalled was related by a friend of mine in Chicago. It was a very bad night and he hadn't any chance to go out. It was snowing. He did not know what to do with himself. He hadn't anything in the room to read, so he rummaged around in the dresser drawers and eventually ran into a Gideon—some of you know what a Gideon is, one of these Bibles, and he opened up the fly leaf and there someone in the hotel had prepared for him and for others that wanted to seek it out a particular group of readings.

They had at the top, "If you are lonely while you are in Chicago and you haven't anything to do read 'Job from 4 to 12.'

"After you have finished, if you are still lonely read Matthew from 14 to 22. When you finish reading that, read further. Read St. Luke from 21 to 27." There was a whole list of these readings if anyone was lonely.

Some wag had gone over the list and at the bottom of the list he had written: If you read them all and you are still lonely call 'Myrtle 6437.'" (Laughter.)

So, as a result of it I am about ready to call Myrtle 6437 because a reputation is something that follows you, good or bad. I suppose, but I say, after all, in accepting this invitation to speak on the subject proposed, it was a challenge to me for several reasons, one being that when I addressed you several years ago I confused you so much that you wanted further discussion of the subject; two, that you wanted to find out if I knew anything else than what I had covered in my first discussion, or, three, in drawing the names of possible speakers out of a hat the Chairman of the Program Committee had forgotten that the speaker had addressed the group on a previous occasion.

Of course, I hope that none of these reasons prompted my return engagement.

Mr. Waugh in his letter of invitation suggested the topic, "The Responsibility for Safety." I doubt if he could have picked a more challenging subject. It is one with which all of us are vitally concerned. It is not a new subject; it will be of concern in future years. Consequently, I would like to open my remarks in a manner somewhat different—at least different for me. I am not an artist. I have no musical aptitude. I have never been able personally to write poetry. However, a poem which may not be a work of art nor go down in literary history as a masterpiece has stuck in my mind since I read it several years ago. I would like, with your permission, to give you this little bit of poetry as my text:

THE BETTER WAY

I'd rather see a sermon than hear one any day.
I'd rather one should walk with me than merely show the way.
The eye's a better pupil and more willing than the ear;
Fine counsel is confusing but example's always clear;
And the best of all the preachers are the men who live their creeds, for to see the good in action is what everybody needs.
I can soon learn to do it if you'll let me see it done.
I can watch your hands in action, but your tongue too fast may run;
And the lectures you deliver may be very wise and true, but I'd rather get my lesson by observing what you do.
For I may misunderstand you and the high advice you give,
But there's no misunderstanding how you act and how you live."

To me the idea expressed in this verse is one that safety men should carry with them wherever they go. It is true today and will be true tomorrow. Too often we blind ourselves to one outstanding fact: That most progress is not based on a revolutionary idea but is rather the re-application of old principles to meet new situations or circumstances.

My concern with the field of safety in this post-war era, and the responsibility we have for it as safety men, is not that the fundamentals upon which all good safety is founded will be shaken by events which follow the war but rather that we will depend on the educational packages and hand book "ready to wear" programs of the war period because they seemed to work in a "boom period" in safety history.

A young chap had been sent into a meeting to learn safety. He had been sitting in those meetings for two days, and out of desperation he said to the Chairman "May I ask a question?"

"Sure, you may ask a question."

He said, "I was sent here by my manager to find out what I can do to hold the men that we are now employing on their jobs. We are willing to spend about $2,000 a year in training men for our plant, but as fast as we get them trained they leave, and I told my management they did not need a trained man; what they really needed was another Personnel Employment man because they were quitting faster than we were hiring them." But out of that whole meeting this chap went home without an answer to that very definite question because the meeting was selling packages, keeping their faces in the market place rather than looking for the answers to problems that are so paramount in this one man's interest.

We must not blind ourselves to the necessity for reapplication of our old principles. Safety must become a way of life and not merely a sermon.

The first responsibility of safety, the first foundation stone upon which any safe program must be built, is that we must demonstrate rather than be content merely telling: "I'd rather one should walk with me than merely show the way. The eye's a better pupil and more willing than the ear." When we show a man how to do the job and the safety involved in his job, we must of necessity change our approach to meet the continuing changes in job requirements. We must of necessity re-describe, re-analyze, and in so doing develop new and better methods; not only better methods of safety but better methods of doing the job. Institutionalism is a disease which I have always tried to avoid.

Let us be sure we are not getting the cancer. We can only give a treatment.

The scholar develops a hypothesis and having proved the veracity of his theory, is content to reiterate and restate it to his pupils year after year. The industrial safety man also develops a hypothesis, but he finds that the actual application, the changing circumstances of the industrial world require a re-examination of the timeliness of his theory. We can never afford to institutionalize industrial safety. We can never afford to close our eyes to the incessant change of industry and our responsibility to furnish safety based on tried and proven techniques, but constantly adapted to meet the situation of the day.

May I ask you what is your safety slogan in your plant? What are the posters you are putting up in that particular plant? Are they telling the story you want to get over or are they just easier to buy than they are to think through the story you are trying to get told?

Our second responsibility or foundation stone is to avoid programs of safety merely for the sake of safety. Every supervisor in charge of a safety program, every foreman of men for an industrial age must remember that his responsibility is one of service.

May I say to you very frankly that I am hopeful that we get a philosophy started where we are willing to give the foreman back his job. We have placed so many specialists in the plant today who are taking away bit by bit the foreman's job that I think it is time to turn it back to him and we will recognize that we, as specialists, are only servants to the foreman who is the line production man within your own industry.

If we are to maintain our principles of letting the men see it done, we must constantly remind ourselves that safety is a function of line supervision. The foreman on the job, not the director of safety, must be the teacher and the safety director. The skilled workman who is used as a safety inspector must not be replaced by a textbook of related information. The safety program of the future, if it is to succeed, must be based on these two foundation stones: First, that the program be adapted in its approach to current requirements; and second, that the program does not involve safety for the sake of safety, but instead is directed towards the fulfillment of the responsibility of the line supervisor and the key operator. Without a firm belief in these two concepts, the safety of the future will not progress in the same proportion as it has in previous years.

The third responsibility for the future can best be expressed by the simple word "planning." We must realize that industrial safety is riding a wave created by unnatural circumstances. We must not allow the surge of demand for our services to sweep our feet from the solid rock which eventually must support the future of our effort. In order to bulwark ourselves for the vicissitudes of the future, we must plan now a blueprint for meeting the needs of the future. We will not find it necessary to consult a crystal ball nor is there any unsolvable mystery surrounding the safety problems which will face us within the next few years.

No company can maintain its position in the industry of tomorrow by producing at the average acceptable rate. The position of my own company in the steel industry can be maintained only by the development of maximum production per unit, and production records are made not only by the built-in capacity of the equipment but also by the built-in abilities of the men who operate this equipment. Our safety program tomorrow must be as many-sided as the production organization including supervision, production workers, maintenance men, and staff specialists.

Production today is built into our equipment. It is comparable within the industry. Wages have been established by government. Prices have been established by government. What is left but better supervision to get out more production over the same units with your particular equipment and your man power, and your man power is the only program you have left upon which you can meet that competition.

We must improve safety methods constantly to meet the increased skill requirements of technological advancement. The past in safety has been a series of changes

to better safety concepts. Today at Jones & Laughlin Steel Corporation we are attempting to meet the safety challenge on all fronts. Today we are laying foundations for the future. We are planning today for the requirements of tomorrow.

The complications of modern industrial supervision require a planned, organized approach to the problem of keeping supervision abreast with the rapid change in their responsibilities. We have established a comprehensive supervisory safety program which provides a means of conveying pertinent information from top management to all members of the supervisory group. It also serves as a channel through which opinions and suggestions flow from the supervisory group to top management. It stimulates deeper thought and more careful analysis of the supervisor's responsibility of safety to his employees himself and to the organization with which he works.

As safety men, we must never gather the comforting robes of self-satisfaction about us nor be content to hear the echo of our own footsteps ringing hollowly in our cloistered offices built from the material of past experiences, so high that they become barriers which protect us from the vicissitudes of a changing world. We must, rather, plant our feet firmly on the broad highway to the future, certain of the fundamentals upon which we have based our plans and meeting the challenge of change gladly because in it we recognize our chance to grow personally and to serve successfully.

I would like to talk more definitely about how we are growing as individuals because the growth of each one of us is dependent upon how the safety movement and the industrial relations movement will grow, and with your permission I should like to ask you a few concepts regarding our own growth in this movement.

The responsibility for safety is further intensified when we examine our personal growth. When we think of personal growth, it is my belief that you can be taught to recognize it but I doubt whether you can be taught growth. However, leaders in pedagogical thought tell us that recognition of the problem is the most important step in the acquisition of knowledge. I would like to discuss with you then some forms of recognition as it applies to the responsibilities for safety, with the hope that they will make your personal growth a reality because you recognize it in others. Let me suggest a few of these for your study because, it seems to me, it ties specifically into the subject, "The Responsibility for Safety.

Growth is revealed when an individual learns to submerge his own personality and desires in the corporate objectives; when he learns that the clarinet player is not judged in terms of his solo performances but rather, by the manner in which the tones of his instrument aid in creating the harmony of the orchestral body.

Many of you are wondering how this can be done without loss of your own initiative, or how you can gain your personal objectives when you stifle your own initiative and think constantly of the value of your efforts to the group endeavor. It is not difficult and yet many men find in this one problem the reason for their lack of accomplishment. It is overcome when the individual realizes that he will be measured in terms of what he produces instead of in terms of how well he can sell himself to his boss.

Growth is revealed when an individual develops a passion for accuracy. This passion will be manifest in various forms: In a meticulousness of thought, of speech, of analysis, of dress, and of action. How can we develop this trait? The cause and effect are one and the same. Accuracy develops an appreciation for accuracy. Meticulousness develops accuracy of action.

Growth is revealed when you develop a sense of belonging. Do you belong to your outfit?

Too many individuals lack realization of the importance of community of effort. Too many individuals feel that the company for which they work is merely a mechanism established to provide the wherewithal for the daily sustenance. I say to you—if you cannot find in your company conditions which make it possible for you to participate in the company's activities and objectives as a junior partner, turn in your resignation and look for an opportunity elsewhere—but only do this after you have determined whether this separation from those with whom you work is not due to your personal attitude.

Growth is revealed when you can reach farther than you can grasp. Important, yes. If that statement is not true, what is a heaven for?

One of the most serious pitfalls confronting every individual is lack of vision and, more than that, a lack of desire to reason beyond his present power to acquire. Many people restrict their thinking to the narrow confines of their allotted duty. Others dream of the future and fail to direct their efforts toward success in the present. This much is certain—more individuals will find success if they give attention to developing the

manual skills required to do their present job and learn to think in terms of how the job and others may be improved. Here is a responsibility we have for safety.

There is one technique, if you would call it that, which will help you to grow in this respect, and that is the habit of asking the question "Why?"

How many of you have examined your forms to find out how many useful statistics you are now getting? Management says, "I guess we will have to think about a standard force. We have too many on the payroll." We should examine those that were put in during the war and throw out those that are not needed. Why should the job be done this way? Why should the present form be used? Why should this report be continued? Why is this process used in making the product? Why do we find it difficult to assume the proper relationship with our associates? A little word, yet, but one which makes possible success and accomplishment when we think of the responsibility we have for safety.

Growth is revealed when a man learns that it is more important to train an understudy than it is to educate himself. Some men have attempted to maintain their position by surrounding themselves with weaklings. Some have attempted to insure their success by making certain that their place could not readily be filled. Some have believed that to give credit to an understudy for accomplishment is a sign of personal inadequacy; but sooner or later, those who have adhered to this philosophy find that their places can be filled by an organization dedicated to the theory that the most valuable production in terms of cost sheets, sales and safety is the production of "men." When we assume a position of safety supervision, let us be sure that we surround ourselves with strong men, with men who do the job better than we, with men of vision, of loyalty, of zeal, and of devotion to the task assigned. They will assure your promotion. You cannot.

Growth is revealed when you have learned to live with those with whom you work. It is not enough to be right. Your associates must know that you are right. Dogma will not make this possible. Personal energy alone will not compensate for this deficiency. Knowledge of the job will not temper the need for this form of understanding of responsibility for the safety movement. The greatest men have been and I believe, always will be the most considerate men. Considerate not because of selfish motives, but because it appears to be a technique which will enhance their achievements—considerate because through experience they have developed a tolerance and an attitude of respect for all men.

Lastly, I would urge that you constantly devote your energies to your personal growth as you consider the responsibility we all have for safety. If you have learned to appraise the presence of growth, you will have accomplished much. You will have learned that you cannot study growth as you would study a picture; and I ask you, is growth taught or is it caught? That you cannot grasp and inspect it as you would a motor; that you cannot analyze it or place it under a microscope; but that you can feel it.

You can feel it in your organization and you are the folks who must help your co-associates grow. Your movement is dominant and your growth will cause others to grow. We must look upon it with a sense not so much of understanding but with a concept of realization that it is there.

John Ruskin once said: "In order that men can be satisfied with their own destiny they must be paid for the work they are doing and they must feel a sense of success in it."

This organization is composed of men and women who have been both academically and industrially prepared for the work of safety supervision. You have accomplished great work. The work has not been completed. The responsibilities are still numerous. I leave you with the hope that you have learned to look at the sun. The man who has will never see his own shadow. The man who has will never find his mind clouded by the dark forebodings of an impossible future. The man who has will find in difficulty the key to growth and in growth the key to success in assuming continuously the responsibility that he has and must assume in this great safety movement.

Let us continue as safety people to look at the sun. That is our responsibility as I see it. Thank you very much.

Chairman Waugh: Thank you, Mr. Greenly. Personally I am satisfied that he lived up to his reputation. Maybe he did not need any introduction. I felt sure that Sam Sain's testimonial should have been enough to satisfy me.

The general tenor of it I liked very much, particularly the growth of the man also

y promoting the man below him to grow also. You will never get his job if he is that kind of a man. If he is not you may get his job.

At this time I would like to call on Mr Campbell Allen of American Rolling Mill, who is Chairman of our Nominating Committee, to give us his report. I would like to explain, and probably should, first, that Jim Gourley of the Timken Roller Bearing Company of Canton would normally become the Chairman of this Section for next year and Joe Collins the Vice Chairman and a new Secretary selected. Mr. Gourley has assured me several times that he will not be able to take this chore on due to having considerable other work and new responsibilities that we feel that he should not try to do it, that is, he would like to but he has so many other things to do that he just does not feel that he can take it on, and Mr. Allen will now give us the results of the Nominating Committee's selections.

Mr. Campbell Allen: Your Committee has met and submits for your approval Joe Collins as Chairman for next year. Mr. Collins is of Youngstown Sheet and Tube. As Vice Chairman Mr. E. O. Kunzler of American Steel & Wire Company, of Cleveland, and Secretary Mr. John Van Syckle, Republic Steel Corporation.

On motion the nominations were unanimously approved.

Chairman Waugh: Thank you, Mr. Allen. Frankly, in going into the next part of our program I do not really feel capable of dealing with a satisfactory introduction of the subject. It states in the program here that we are going to deal with the Industrial Hygiene Developments Relating to Safety, and we asked two gentlemen to discuss this problem from several different angles; we have asked Mr. Theodore P. Hatch of the Industrial Hygiene Foundation of Pittsburgh, who is head of the Membership Relations Department or Division of that organization to talk to us first.

Mr. Hatch comes very well qualified. Perhaps some of you know that better than I do. You may have heard him talk at the National Safety Congress or other places. I can assure you that he knows his subject.

I have been provided by Mr. Hatch, at my request, with some of his background. He was an Instructor of Industrial Hygiene at Harvard University, Associate Dust Control Engineer, New York Department of Labor, Associate Professor of Industrial Hygiene, University of Pennsylvania, and his military service—I might mention before I go into that that Mr. Hatch is also co-author of a book on "Industrial Dust", collaborating with Professor Philip Drinker, I believe, of Harvard in this work.

He is a Director of the Industrial Hygiene Foundation, and I believe that is his chore most of the time, but this military phase of Mr. Hatch's life—he is a very modest fellow and someone called my attention to the fact that he is wearing a pin which he prizes very highly. It is called the Legion of Merit and it was awarded for service as Research Executive, Armored Research Laboratory engaged in work on Design of Armored Vehicles and other weapons resulting in increasing combat efficiency and saving lives.

It was not at Mr. Hatch's suggestion that I mention this, but I know he is very proud of it and justly so because he is one of the many civilians in military service who have supplied the weapons and the means for our men to fight a victorious war, probably with considerably less loss of life.

I think I have probably said more than Mr. Hatch would prefer to have me say, but I hope you will pardon me if I have overdone it. I, however, do not think so.

So, I believe that it would be well for us to get on with our program, and it is with considerable pleasure that I introduce Mr. Theodore P. Hatch of the Industrial Hygiene Foundation who will discuss the subject of Industrial Hygiene Development Relating to Safety.

Mr. Dyktor will be heard later on on another phase of this subject.

"INDUSTRIAL HYGIENE DEVELOPMENT RELATING TO SAFETY"

Mr. Theodore F. Hatch, Head, Membership Relations,
Industrial Hygiene Foundation,
Pittsburgh, Pennsylvania

Mr. Chairman and Gentlemen:

The Chairman has been kind enough to refer to my recent military connection along with many others in the recent war. I should like nothing better than to talk about my own personal experiences and the experiences of others who were associated with me in the Armored Medical Research Laboratory because the work which confronted us there and the experience which we had have some very real significance in relation to this problem which we are interested in here this afternoon in Industry.

She asked one of the boys, "Johnny, what does that demonstrate to you?"

He said, "It teaches me if I drink whiskey I won't have worms." (Laughter.)

So, when accidents are caused I think we should teach our membership the cause of the accident and probably prevent the next one.

However, speaking of a particular case that happened in our organization sometime ago: One of our members running a table saw lost a finger and will probably lose another one. His hand is pretty well bunged up. Well, the contractor had to pay an additional penalty of 35 per cent.

Later on this particular man went to another job. They wanted him to run the saw. Having in mind his accident, he didn't want to do it, and he didn't do it.

Anyway, there was a new man on the job, and they put him on the saw. The man that had had the accident kept telling the man running the saw that he had better be careful.

"Oh," he said, "I have had a lot of experience and I know how to handle these saws."

The man that had had this accident was trying to tell him to be careful, and he was just too careless to listen.

Well, later on this particular man running the saw tipped the table with the saw running and reached under to tighten a bolt that holds the guide, and he lost a couple of fingers. He just wouldn't listen to the teachings of the man that had suffered.

So, then, the contractor said in a casual way, "Well, I'll put the man that has been trying to tell this man what to do back on that. He has had an accident. He should make a good saw man now that he has lost a couple of fingers."

I think as we go along if we could teach the members of our organizations the causes of accidents that have happened they would derive a lot of benefit from it.

Chairman Pearse: I would like to have our nominating committee report as to whom they have selected for the officers for next year. John Jockel and Homer Davis were appointed to that committee yesterday.

Mr. John W. Jockel; Secretary & Treasurer, Ohio State Conference Bricklayers and Masons, and Plasterers Union, Cleveland, Ohio: Mr. Chairman:

Your nominating committee appointed by you met this morning. We checked over the cards to find out who to nominate for vice president next year. We wanted to select an employer for the coming year.

Your nominating committee is sorry to say that we were unable to find any contractor's name on those cards that we could recommend to you to appoint next year.

We believe that these offices should be distributed amongst the different parts of the state so there will be more interest in these congresses. We feel that if we have them all from Cleveland, or all from Columbus, we will have a gathering from there and not from the rest of the state. We felt we would like to distribute the office this year down through Cincinnati or someplace like that, and by doing that they might be able to get a larger delegation.

I haven't seen the cards lately, Mr. Chairman, have you seen any cards lately that indicate we have any employers here?

Chairman Pearse: It is just as bad at it was yesterday.

Mr. Jockel: It just shows you, Mr. Chairman, the interest the employers of Cincinnati and Dayton and Columbus and Toledo have taken in this congress.

Your committee came to the conclusion, Mr. Chairman—and we hope that it meets with your approval in this congress—that we recommend that we as the nominating committee will contact the Association of Employers of Toledo, Ohio, and see if we can't get their association to recommend a name to us for a person to be vice chairman next year. We make that recommendation feeling that when Tom Bentley was alive he was always very interested in safety, a very prominent man in safety, and by making that recommendation we might be able to get a good employer next year to be vice chairman, and he would be picked the next year as chairman, and we might bring more interest back in Toledo for this congress. That is our recommendation.

Chairman Pearse: Did I understand you to say that you selected a chairman, but you did not select a vice chairman?

Mr. Jockel: We recommended that Vice President Waller be chairman next year, and we are recommending that we select a vice chairman from the Employers' Association for next year from Toledo, Ohio.

(On motion the suggestion was adopted.)

Mr. Waller: Mr. Chairman: I appreciate very much having the honor of being your chairman next year. I hope I am able to live that long and all of you are able to come

back and bring more people with you—not just because I am chairman, but because of the message you receive here to take back to your fellow workmen.

Chairman Pearse: We are going to ask our old friend, who has been in this safety movement as long as it has been going, the same as Homer Davis—you notice I picked out two old wheel horses for this meeting today—to give us a talk on, "Requirements for Safety on the Job." John W. Jockel will talk to us now. He is secretary and treasurer of the Ohio State Conference Bricklayers and Masons, and Plasterers International Union, Cleveland, Ohio.

"REQUIREMENTS FOR SAFETY ON THE JOB"

Mr. John W. Jockel, Secretary and Treasurer,

Ohio State Conference Bricklayers and Masons, and Plasterers International Union,

Cleveland, Ohio

Mr. Chairman and employers and laborers of the All Ohio Construction session:

Before I go into my general remarks, I have a few things to say. I am not going to keep you very long.

I can't quite understand, being on your nominating committee for this year, why we can't have more employers within a radius of 50 miles of the vicinity of Columbus to attend these safety congresses. There is something wrong. They don't take an interest in it, and we must try to find out why it is. I do believe the closer you are to a meeting the less representation they have in that city.

We have a few delegates from Cincinnati, and we have one that I know of from Dayton, Ohio. We do have quite a few from Toledo, and a great delegation from Cleveland. We even have a little town like Lorain, Ohio, which sends a man from the Building Trades Council. It shows you in these small territories they are even taking interest and having a man come down here and spend a few hours.

The subject the chairman asked me to talk about is, "Requirements for Safety on the Job."

Well, the requirements are all in this book, Bulletin 202. If you would read these safety requirements I wouldn't have to tell you what they are. But I know from experience that there are only ten per cent of the representatives of labor and only one per cent of the men who work with the tools, that know that we have a book like this. I believe there are only about 15 per cent of the employers who know anything about the provisions of Bulletin 202.

I happened to attend a meeting here about two years ago with Bill Morrow. It was a building trades meeting. We talked about safety and Bulletin 202. The business agent of the building trades council said to Mr. Morrow, "What is this Bulletin 202 you are talking about?"

There was a man that was secretary of the building trades council of a large city and he didn't know that they had Bulletin 202 in effect.

Now, I would like to tell labor that this Bulletin 202 was the hard work of organized labor. We found out back in 1919 there were no requirements in the construction industry. It was a question that you had to make a complaint to the foreman or the contractor on the job that the job wasn't safe, and that night at four o'clock you got your check, or you got your check at twelve o'clock that Saturday, just because you made a complaint, because you were asking for a safe place to work.

So, labor in the building industry decided that there was only one way to prevent accidents in the building industry and that was to have requirements passed by the State of Ohio whereby you wouldn't have to lose your job so often, and you would have requirements that would be very specific so that the employer would know what to carry out to prevent accidents. So, now, you have this Bulletin 202. You have had it since 1921. It came from 98 sections to about 340. It has been revised three times.

Now, these requirements are for the employers to carry out. This book is for the employer. He has to see that those requirements are carried out on his operations. If he will carry out these requirements on his operation, there will be no question that he has done his duty, and there will be a lot of accidents prevented.

Now, they want to know why labor doesn't take more interest in safety and prevention of accidents. The only time a man that works with tools in a trade is interested in safety is when he has an accident. Your vice chairman told you that. From that day on he knows more about safety laws than the men who drew the law up.

I don't say all employers, but we have quite a few employers that are not interested in safety and in advising their superintendents and foremen to see that the laws are carried out. When the employers wake up is when you put a penalty on them. From that day on they are on the job.

I had two or three employers in Ohio who were penalized. When they got their 35 per cent—one got 40 or 50 per cent—they said, "Jockel, from now on we are going to be more careful."

That is why we gave up the right to sue, so we could get the specific requirements. We decided that the only way to wake up a contractor was to penalize him a percentage and have that come out of his pocket—not out of the Commission's funds over there.

I don't like to see everybody get hurt to be interested in safety on the labor side. I don't like to see employers penalized to get them interested. But I do believe that, while the employer has a responsibility to see that his job is safe, we as workers have the same responsibility to see that the places where you work are safe, also. If they are not safe before you go on, you have the right to advise a foreman or superintendent that the place you are going to work is not safe, and he will correct that.

I know there is no employer in the State of Ohio that wants to injure anybody or kill anybody. They are all human, and they don't want to hurt anybody. But we find out that 99 per cent of your employers never get on the job. They are busy figuring jobs. The biggest job today is trying to get labor and material. They may have to play the black market a little bit to get it.

So I say that we as workers have as much a responsibility to see that this code is carried out as the employers.

You heard the figures yesterday from Mr. McDevitt of Pennsylvania that 88 per cent of the accidents are caused by the men themselves. That is correct. Now, if that is correct, I must say to our people who are our representatives that we should try to get our men safety-minded.

Now, I have heard a lot about being safety-minded, but being safety-minded doesn't mean anything unless you have safety-mindedness in your heart. You can tell them to be careful. That is just byword with them. If a man isn't sold on safety and hasn't got safety in his heart, he isn't going to be safety-minded. We have got to try to educate our people that we represent so they will be sold on safety from the inside. If we will do that, I believe we are going to do our job.

As I said before, while the employer has a job to do to carry out these requirements which are made for him to carry out, we have an equal job to do in cooperating with him.

Now, the employer can't be there watching everytime you make a move to see whether you are being careless. If he was there, it would cost him a lot of money. But you know men who have been working as bricklayers or carpenters for 40 years, and they say, "I have done that all my life." If you would give him a kick in the shins once in a while and talk to him you might be able to get him to be more safety-minded before he gets hurt.

You take on a lot of our operations, the requirements in the building industry say the employer must put a guard rail on scaffolds. He makes everything safe. Along comes a plumber or another tradesman and he says, "I have got to take that guard rail down because I have got to put some material there to do my job." He takes the guard rail down. He walks away and doesn't put it back.

It says in this book that the sub-contractor who takes that guard rail down must put it back, but it doesn't say that if he takes that guard rail down and doesn't put it back he is going to be penalized. They are going to penalize the man you are working with.

I say there are a lot of our tradesmen who make changes on the scaffolds, like guard rails. If they would put this safety rail back, they would be doing their job to protect their fellow workmen.

The Safety and Hygiene Division claims that they go around and talk to an old worker and he says, "Well, I have done it all my life and I never got hurt." He says, "Baloney for you."

Now, we just had an accident down in Cincinnati—a bricklayer from Cleveland. I worked with him around 40 years ago for the Ferguson Construction Company. They are sold on safety. They believe in safety. They have addressed our congress several times.

Brother Baker from Cincinnati called on this foreman and told him, "I have been out here a couple of times. You have no overhead protection. There are men working above these bricklayers and other people. You must have overhead protection." He was out there two or three times.

He said, "I have been foreman for 43 years and I have never had an accident."

Well, the next day he fell off the scaffold. There was no guard rail on there. He seemed to get some kind of a little spell, and he reached for the wall, the brick wall, but the brick wall wasn't there. He happened to go over to the other side, and he fell through the air. He went down eleven feet. He was in the hospital three days, and he died.

That is a case I want to bring to your attention. He was one of these old time men that had this old byword, "I have been laying brick and tile for 40 years and I never got hurt."

There is always a first time. There was that man's time. He has now been buried about a week.

We had another case in Cleveland, a contractor, where a brick foreman was doing some underpinning to put in an I-beam. Instead of shoring it up, he turned around and took out the brickwork. He was very careless. The brickwork started to come down. He jumped to the side. There was no guard rail there. He fell over, and he died in a couple of hours.

I am just bringing these points out to show you that our men are just as careless as the employers.

Now, we have a mutual agreement or understanding about safety. We must cooperate with the employer as much as he must cooperate with us. If we fail to do our part and advise the contractor or the superintendent or foreman that the operation we are going to work on is unsafe, we don't care to go on it—if we go on it it is going to be our funeral, and the employer might be penalized.

Mr. Homer Davis told you that the men who are hurt must suffer. If they are out of employment six months their families suffer. If the man gets killed, then his children must suffer through lack of support and education.

So I say to the employers—there are only a few up in front here—these specific requirements are the same as a specification on a job. I think it is your duty, whether you have a large job or a small job, to give these specifications on the job you are going to build and say, "Tom Jones, here are the specifications and plans to build this building. Here are also specifications to save the lives of the building tradesmen on this job."

If he will carry out the specifications in the construction industry for safety, I think that we will then both do a very good job.

The idea of accusing the contractors that they are causing all these accidents, and they accusing us, is the wrong way to cooperate along these lines. They are no more responsible than we are, and we are no more responsible than they are.

But I say, if you go back from this meeting and don't carry out the things you hear here and give them to the rank and file whom you represent, then your time down here is just wasted.

Those who have come here today and yesterday no doubt came here to hear a message and go back and do something. So I believe that now that you have got the message and you have got some information here that you might digest that you have not heard before, you should go back home and try to sell it to your local membership and try to show them that they should be more careful on the operation.

Now, coming to these meetings we see a lot of figures. Now, we are talking about these posters. I have been a chronic crab on these posters for over ten years. I have come to the conclusion that they aren't going to do anything about it. I go over there as an individual. I talk to Jim Fluker and Sain and Kearns. They say it is a fine idea. But the idea doesn't mean anything to them.

I came to the conclusion right this morning when Jim Fluker said he was going to consider this and talk to somebody, that they aren't going to do anything about it unless this organization today takes some action. We should have a committee go over and call on the Commission and tell them what we want.

I call on the superintendent and he says, "John, that is a good idea. I will take it down to the Industrial Commission."

He takes it down to the Industrial Commission and talks to them. They say they think it is a swell idea. It is a swell idea, but it hasn't got anyplace.

A few years ago we had the Safety Director out at the White Automobile Company. He asked me if I would come over there. They got an artist that would draw pictures, first, as labor being careless in excavating. Glen Lockwood said they would do it and they would pay for it. He would have the artist draw a picture on the first job. They could hang it on the shanty and in the union hall. It would show where a laborer is going into a ditch or any excavation without shoring. He would see this man got killed. If he sees he is going into a dangerous spot he will tell the employer he won't go in unless it is shored.

Next, the bricklayer: He goes on a scaffold and there is no guard rail. That picture will show that he fell off and broke his back, or maybe got killed. That would be hung at the bricklayers' shanty, in the bricklayers' hall. Then, they would have a carpenter and a painter and a plumber.

There is something men will look at and think that they have done the same thing a hundred times and haven't got hurt, but this fellow got killed.

Now, all these figures about 33 eyes and 99 legs—you are just like any human being, you will go by and look at them and say, "Too bad." But if you paint the picture to them on a good poster like your chairman suggested, I believe it will help a lot.

The Commission has got $1,093,003 in that fund over there. They can certainly spend a thousand dollars or, say, five hundred dollars and get plenty of these posters to put on the operation. I do believe if we get these posters printed and put on jobs that we will save many, many accidents in the building industry.

So I say, as far as I am concerned, the posters don't mean anything as far as us talking here is concerned unless we appoint a committee or a permanent organization and call on the Commission ourselves.

Now, I brought some cards along. I would like to have the men pass them out.

About 15 years ago we had an organization in Cleveland backed by the Industrial Commission. We had a man down there from the Commission and he would take a record of all the accidents. The employers at first didn't want to use the name. They said, "We might make a specific report and you would use it against us as a violation." We decided we wouldn't use it as a violation, because we felt we wanted to be honest with them.

On the back of this card it says, "Could this accident have been avoided? If so remarks."

I believe if we could have every union in the building trades in the State of Ohio, when a man is injured in an industrial accident, take out one of these cards and fill it out. It would be a good thing. Forget the employer's name if you want to. Just put down the address, the trade he represents, the description of the accident, and how it could be prevented. Then we can come back here next year at this safety congress and tell you of 100 accidents or 200 accidents in Ohio where that man was injured or killed and how it happened, and how it could have been prevented. Then, you could go back home and explain to your members these specific cases.

But just having a lot of figures, so many back injuries, and so many eyes, and so many legs, and so many permanent and total disabilities and deaths, it doesn't put over to the working man exactly what we want to give him. I say our posters and these reports that we could have to bring to our next safety congress would be a very good thing to prevent many of these accidents.

Now, they talk about the moving pictures. That wasn't brought about by the Industrial Commission so much. It was brought about by labor. We have been going around to these area meetings, and we find out that they have these moving pictures showing where a fellow lost his finger.

A fellow over in Canton fainted, a labor man. He got sick. He fainted. They had real color pictures. They showed the blood coming out on the picture. They got the idea.

Some of the labor organizations in the last convention passed a resolution to ask the Industrial Commission to get some moving pictures of the building industry so when we have this congress we can show the actual pictures where all tradesmen are doing a careless job and they got hurt.

When this was brought before the Commission it got as far as across the road to the Governor. He decided he was going to call in all these movie operators and see what they would charge to take these pictures.

I told Harry Suhr the only man to get a picture right is a man who knows what these accidents mean. So, they have got a man now. I don't know what his name is. He is a Major General. He takes these pictures. He is going out. When we get these photographs we are going to have a very good job. It just shows you it takes meetings like this and other labor meetings to bring these to the Industrial Commission's attention.

Now, another thing: I don't think many of these employers know anything about this industrial public health hazard code.

About six months or a year ago I asked the State Department of Health what law was on the statute books whereby they could go to steel plants and make a survey of men getting silicosis and dust and being gassed. They called me down to the office of Colonel Flanagan. He was from the State Health Department.

He said, "We have no law. We can't do a thing about it. But," he said, "if you will make a specific complaint or name a certain steel plant or job, we'll send a man out."

I said, "I don't go into these plants. It is up to you to make a survey."

So, they had to bring down the legal mind from the Department of Industrial Relations to see if there was any law on the statute books saying that they could make a survey to help the working man. They decided they had no law and they couldn't do anything about it.

So I said, "What I am going to do is have a law passed by the State Legislature to make it necessary for your department to do that."

All of a sudden, some pressure must have been brought to bear, and they asked the Attorney General for a ruling on the case. The Attorney General ruled that the State Board of Health had authority to make specific requirements regarding the health of the people of the State of Ohio.

So, they called me in and said they were going to have a meeting on a certain day. They said, "It all depends on how these people are. Some are farmers, and some are business people. They have a right to adopt this code."

I was advised yesterday by Colonel Flanagan that this health code has now been adopted as a specific requirement. It covers respirators and fans. There are going to be a lot of things for you tradesmen that must wear respirators. If the employer doesn't carry this out, the law says he can be fined and penalized. You don't go before the Industrial Commission and make a complaint. The State Health Department goes in there.

Here is one thing for respirators:

"Sanitation of respiratory equipment:—The employer shall provide an approved means for cleaning and sterilizing all respiratory equipment, and it shall be the duty of the employer to cause such equipment to be maintained in a clean and sterile condition. Respiratory equipment shall not be passed on from one man to another until such equipment is cleaned and sterilized."

That has been our argument. They take a respirator to John Jones. He uses it. Then they take it to Jim Smith. This says it must be sterilized.

"When filter or cartridge type respirators are used, each employee shall have such respirator for his own exclusive use."

You can't hand that respirator to each man. It must be his only.

"Respiratory equipment and replacement units shall be stored, when not in use, in approved containers."

That is what it says about respirators being sanitary.

There is another section here for dust elimination. It isn't very specific. I like it. It is something from now on for you men who run saws and there is dust in an enclosed room, or outside. It calls for a hood, a suction fan and everything else.

Now, of course, this is not going to be a part of these specific requirements in this book here, because this is approved by the Industrial Commission. These health requirements have been approved by the State Health Board of Ohio.

I suggest to you employers that you familiarize yourselves with these requirements, because you are the fellows that are going to be penalized.

It says back here at the tail end:

"Regulation 255. (Violation). A violation of any of the provisions of the foregoing regulations, or failure to comply with any orders made pursuant thereto by the Ohio Department of Health, shall subject the persons so violating or failing to comply to the penalities provided by law."

What the penalities are, I don't know. But it means that if you don't carry out these health regulations that they have adopted, they can go on the job and suggest changes and you will be penalized. That will be the contractor, of course. The employee doesn't get anything out of that.

I believe, since this has come out--it is in print; we just got them printed the other day—everybody should go over to the Department of Health and tell Mr. Flanagan—you see him around here with a soldier's uniform on— that you would like to have several copies. I don't like to see any employer fined. I think you ought to get a copy of that and familiarize yourself with what you have to comply with so you will be able to carry out the requirements of the State Health Department.

Now, we were talking yesterday about veterans coming back home. Of course, they are full of ginger and a lot of other stuff. There are going to be a lot of careless boys.

Now, today every apprentice boy is a veteran. You know that yourself. The fellow went to war and he came out. So, every apprentice boy is going to be a veteran.

I concur in the remarks I heard yesterday. I believe that we should do like we do in the schools, start with the youngest and teach them to be safe, not to go across the street against a red light.

All these unions have adopted plans to get this G. I. money and assistance pay for

apprentice boys. You must have a local plan approved by the State Apprentice Council; otherwise, the veteran isn't going to get any money

This plan adopted by all the unions, I don't care who they are, and signed by the employer—it says in their third year they must be required to understand the building codes. One says they must understand safety in regard to tools and scaffolds. Now, you have got a wonderful opportunity, you organizations who have apprentice committees set up and have apprentice boys, to follow out the standards of this apprentice agreement here. You can give that boy the teaching from the time he goes on the job. You can tell him how to be careful and not have any accidents.

Jack Burns says a lot of these young fellows will have to get some information from the older fellows. Let me tell some of these older fellows that the fellows are being careless. They did that for 42 years, and they got careless. I think the only way is to start out with the apprentice boy so when he becomes a journeyman he will be very much more safety minded and sold in his heart on it so that when he gets on a job, running a job, he will have all the platforms and scaffolds in a safe condition.

Now, the next thing we were talking about was more men for the Safety and Hygiene Division. I agree with that. We are lucky in the building industry, gentlemen, to have men who will go out and sell education and safety, who are practical building tradesmen.

When we agreed to forego our right to sue, we were very careful to see that those men came from organizations in the building industry so that they know what it was all about. The trouble is today—looking over your list here—you have only seven men in the building industry. Arnold Bill said he called on a job once every 30 days.

Now, from the premiums the employers pay in one per cent goes to the Safety Hygiene Division. They claim they have got over a million dollars in that fund. I don't believe in robbing the fund so that when a depression comes around we don't have any money in there, but I do believe we have six or seven good years ahead of us, and the Safety and Hygiene Division, or the Industrial Commission, could put plenty of men in the field and get them started.

As Mr. Kiefman said yesterday, he invites the people to come and see him so they can make suggestions.

I say it is up to this sectional meeting here today—if we don't form a permanent organization—to make a recommendation to the Industrial Commission that we think will hold water, to get enough men in the field that they can make a job at least every two weeks—not every 30 days.

Now, I was advised yesterday—it might be true; we will have to find out further—that this one per cent for the Commission was going to be cut off. I think the employers and labor should make a protest. One per cent of $14,000,000 would be $140,000 a year. They are going to take that one per cent off entirely now and use the money they have got in there.

The law says they can't assess more than one per cent of the premiums paid into the Compensation funds. Now, I believe you employers, as well as labor, should make a protest and ask the Commission to cut off only one-half of one per cent, instead of cutting off the whole one per cent, and get a little fund in there. If you are going to get some more men in these fields you will have to have more money. There is no use waiting until your money is all gone and, then, the payroll gets low and the money comes in less and we won't have any money.

After I get through, if anybody in the audience has any interest in this thing, if you think that my ideas are all right, I am going to ask you to make a motion to carry that out.

Now, you heard Jim Fluker say that the men you have are doing a wonderful job. They are doing a wonderful job. They are experienced building tradesmen. They know what it is all about.

What happens in some departments? They appoint inspectors that are not building tradesmen. They go on a job. They take the blue book out and see a section. They get out the rule. They measure a plank and they say, "You aren't complying with the code."

Well, a practical building tradesman doesn't have to look at any code. He has good, common sense. He knows by looking at the scaffold if it is going to be safe. If he thinks it isn't going to be safe and he wants to show the employer the violation, he gets out the book and shows him the violation.

So far we have been fortunate in that the men in the Hygiene Division haven't been politically appointed. But let me tell you something: It is going that way now. It is like all departments that labor fought for. It is swell. They put in practical men to run these departments, inspectors, and investigators. It runs about ten or fifteen years, and then what happens? The boys across the road say they have got a good

friend over here that is a good Democrat or Republican. How about it, see? They send him over and put him on the payroll.

If you are going to stand for that, you are going to have men coming on your job to educate you on safety that don't know what it is all about.

When this law was passed 23 years ago, labor was very careful to say that these men must be employed from day to day. You don't have to appoint them for two years when you have a new Governor. If these men don't do the job, tomorrow they can be fired and you don't have to say a word about it. They didn't do their job.

We also recommended that the Governor was the only one that could approve the wages. The Commission recommends their wages. At that time we started them out at $270. Now, they get a little better pay.

So, I have come to the conclusion that if you laboring people, and employers, also, don't watch this Safety and Hygiene Division you will just be coming down here to a bunch of politicians, and that is all.

When the labor men of the State of Ohio gave up the right to sue, it was for one reason only— to have codes with specific requirements to prevent accidents, and if the employers didn't carry them out they would be penalized. The employers agreed with us. We understand each other.

I noticed when Davey was in there they sent a few friends over. They said, "What do you know about safety?"

The fellow said, "I don't know anything."

They said, "Get out of here. We don't need you."

When Mr. Bricker was in there they had a county politician that had a friend, and they put him in there.

We must let the Industrial Commission know what we want is for these inspectors and supervisors to be practical men, and if they don't do the job, let them go.

I have been told lately that these fellows are going to be a bunch of bookkeepers. Now, you know if you tell your business agent, "Tomorrow you come in at nine o'clock," and when he gets in the union tells him, "Now, you make a report every 30 minutes of where you go, what time you are going to go to lunch, and how many miles you are going to go," your business agent would be busy making out reports.

I have been advised now by the grapevine system—you hear them talking around here—that these men must have a district, they must start at eight o'clock, see? Well, they might drive 30 miles. They could investigate 17 jobs. Every time they make a move they get a pencil out. They get down and say, "I went 20 miles." They put that down. They have to say how much gas they spent and what they did. If they go out with a blonde someplace, they have to put that down, too, I suppose.

I am just trying to bring out, gentlemen, that somebody is getting crazy over there. They are trying to make this department mechanical.

You know yourself you can't tell a business agent what he has to do from the time he starts in the morning until he gets home. He has to use his own judgment.

These men are the same way. You have to give them a free hand. You have got to let them go out and know where the jobs are and investigate them and make recommendations. They don't have to worry about having these regulations that get these fellows to be bookkeepers.

They have in that law that if they don't do the job, they can fire them tomorrow morning. I think, so far as we are concerned as employers and labor, we should ask them not to have these men spend half their time making out papers, but allow them to go on the job and do a good job.

I was on that committee that decided to forego the right to sue. That was for one purpose alone. It has nothing to do with politics. Democrats, Republicans, Socialists, Communists or whatnot. If he was a man who could fill the job and was a qualified building tradesman, that was his job.

So I hope, Mr. Chairman, that we can get the delegates here today to fill out those cards so that when we come back here next year we can report to the delegates the exactly true accidents that happened, and how they were caused, and how they can be prevented.

Another thing I would like to do: I would like to take some action again—for the fifteenth time, I suppose—to have a committee and ask them if they are going to make these posters. If they don't, let's go down in our own jeans and make them ourselves.

The next thing: Let's ask them if they won't reconsider their action of taking one per cent off entirely. Let's ask them to take off one-half per cent and see if we can't go at it gradually, because things change rapidly.

Mr. Chairman and delegates here today: I would like to see you form what you would call a permanent state organization where we could meet twice a year. Now we

meet once a year. Say, we could meet on a Saturday or Sunday, get away and spend a whole day on things we have on our minds to make a safer place to work on the job. We could have a permanent organization.

You know, some years ago they started bringing in different laws they were going to recommend over in the legislature. I was a little opposed to that, because what we were going to deal with was safety only.

I believe, Mr. Chairman, we could do a wonderful job, because we could meet twice a year, or maybe three time a year. Then, we could go over to the Industrial Commission and say as a state organization of building employers and laborers we were recommending certain changes we thought were necessary to prevent accidents in the building industry.

Mr. Chairman, I didn't think I was going to talk so long, but I like to explain these things about the health code, and how hard we have worked to get these codes.

I want to tell you something—this is the last word I am going to tell you—I told you a couple of years ago you would never have had a safety congress in the State of Ohio, you would never have had a safety code in the building industry, if it hadn't been for the building trades of the State of Ohio.

What brought that about was this: For five years we demanded that they pass a code. The employers said, "We will agree if you take away the right to sue. What is going to happen is, as soon as we have a code—and I agreed with them; I couldn't help it—'A shyster lawyer will say, 'Well, here is section 94. John Jones, you got hurt.'

"'Yes.'

"He will say, 'You must get $100,000.'

"The workman would say, 'How much do I get out of it?'

"'You get $50,000 out of it.'

"'Well, go ahead.'"

We found out the percentage was very small of the men who sued that got very much. Instead of getting $5,000 for a death, they got $800.

Mr. Arnold Bill, Division of Safety and Hygiene, Columbus, Ohio: Only 12 per cent of those that sued ever received any damages.

Mr. Jockel: That is why we changed our minds. Gentlemen of the building trades of the State of Ohio, through enforcing our code we took away the right to sue. We started the department. The employers were very favorable to go along with us.

I hate to blow our own horn in the building trades, but that is the truth.

Mr. Homer Davis, Treasurer, Cleveland Construction Company, Cleveland, Ohio: Mr. Chairman, At our last meeting here in 1944, April 19, we passed a motion requesting the Division of Safety and Hygiene to make a digest of this Bulletin 202.

I talked with Mr. Morrow yesterday regarding that. He said, "Well, I have made up my various charts. I have submitted them to the Commission. But in view of the fact that we have about 27 other codes relating to other industries in the state, they thought it might be a bad practice and set a precedent if they established and put out this detailed digest."

The Builders Exchange in Cleveland, when this code first came out, put out just about a dozen pages hitting the high spots which would relate ordinary to scaffolds, ladders, and so forth, which would be very helpful to the carpenters and the bricklayers. It told them the kind of scaffold, and the construction of it, that would be required and permissible.

Now, in view of that circumstance, I told Mr. Morrow, "Well, if you will afford Mr. Jockel and I—" He doesn't know about this, but I am going to tell him about it—"who happen to be on this committee assigned for this morning's set up here, your charts, I believe that through our own divisions, the Builders Exchange, general contractors and the various labor organizations, we will have those digests made and we'll see that every foreman and sub-foreman and most of the mechanics are furnished with copies of those digests."

They cost us about 10 cents apiece printed, we'll say, in ten thousand lots. I think it will be ten cents well spent.

John, if you want to think that over and talk it over with the boys, I will assure you on behalf of the employers some way or other we'll ride along with you, because I think it is a mighty nice gesture.

Now, there is one other thing I would like to bring before this body.

If you boys recall, about six years ago when we were trying to revive the construction industry we had an influx of jerry-builders. You have got them today.

At that time I made up a list, taken directly from the permits down at the City Hall and from the various town halls around through Cuyahoga County, of a little over 5,000 names of men or concerns who professed to be, or at least styled themselves as

contractors. I sent that list down here to the Industrial Commission, to Tom Gregory, then chairman. He had it checked, and we had only 1900 of those contractors who were paying any contribution into the Industrial fund.

I sent the same list at that time to your chairman of the Unemployment Compensation, and they found only 1300 of over 5,000 names, who were paying into the Unemployment Fund.

I sent the same list to the Collector of Internal Revenue in the Cuyahoga County district. I never even got a reply. I don't know what checking he did to find out how many of these fellows were paying Old Age Pension Insurance.

Follows, that is the situation of these jerry-builders who carry their books in their vest pockets. They don't make a report to the Industrial Commission. They don't make a report to the Old Age Pension or to the Unemployment Bureau. We naturally feel that is unfair to you and to us.

In the first place, they are our competitors. We do feel that an extraordinary effort should be made by the Industrial Commission over here to revive and stimulate and further the investigations by your payroll compliance department, which has been practically put on the shelf for the last three years.

I would offer a resolution that this body by motion request the Industrial Commission to revive and re-man their Compliance Department, Payroll, Compliance Department, I believe it is called, and carry on full investigations.

Mr. John F. Burnes, Business Manager, Cleveland Building and Construction Trades Council, Cleveland, Ohio: Second the motion.

Chairman Pearse: You have heard the motion, gentlemen. Are there any remarks?
All in favor say aye. Contrary, no.
The motion is carried, gentlemen.

Mr. James A. Sheehan, Carpenters' Local 1106, Cleveland, Ohio: In regard to Mr. Jockel's remarks: I may state that the District Council of Cleveland, the Carpenters' District Council, has had this in effect for a number of years. In fact, we use it in duplicate. If a man is injured on the job, an accident report is made up and sent down to the Carpenters' District Council, and another one is turned over to the employer. In that way we keep track of any accidents on the job.

Chairman Pearse: That is a very good idea.

Now, I think that you business agents particularly should be very careful of these jerry-builders and not send your men out until you find out if they have got insurance coverage. You are only protecting your own group. I think that is very important today when they are springing up all over. Mr. Kleiman told you yesterday there are 200 in Cleveland that he knows of in the last few weeks.

Now, I am going to take the bull by the horns, with your permission, and appoint a committee of Mr. Waller, Chairman, and Homer Davis, Vice-Chairman, to get these posters through for us that we have been talking about. We have fiddled around with that long enough. Now, let's get a little action.

Mr. Waller is right here in Columbus, and Homer is down here often. I think they can do something.

Are there any objections to that?

Well, that is in effect, then.

Another thing I am going to do: I am going to appoint Mr. Jockel here as chairman, and I am going to appoint Fred Kleiman as vice chairman, of a committee to see if we cannot get more manpower in the Industrial Commission, both for the Compliance Department and for the inspection. It is up to them to draw up a resolution and send it from this body and follow it through and report back to us at our next meeting.

Are there any objections to that?

All right, gentlemen, we are going to do that. We are going to try to get this thing through. If we don't take certain action, we will never get anywhere. We can try it this way. We talked about it and we got nowhere.

Mr. Sam Naumann, Bricklayers Local Union No. 5, Cleveland, Ohio: I would like to say a word relative to the remarks that were made yesterday by Mr. Kleiman and dwelt upon by you just a moment ago. You said that the business agents should check up a lot of these jobs.

Well, I believe that most of them do that. As far as our organization is concerned, we don't permit any of our men to work for contractors that aren't covered by the Industrial Commission Insurance. We make it our business to find out whether these contractors that our men work for are covered by the Industrial Commission Insurance.

it has been going on for a good many years, as far as we are concerned. If we find any employer that doesn't carry compensation, the men are not permitted by law, in the first place, to go to work for an outfit of that type.

Referring to the jerry-builders: Mr. Davis in his remarks made a statement that I would like to ask him a question about.

When you made the statement that the general contractors were charged with so many man hours—I forget the exact number—did that include the home builders, or just the general contractor?

Mr. Davis: 5601 is the general contractor. 5040 is the classification for residential building.

Mr. Naumann: You didn't take that into account?

Mr. Davis: That is mentioned separately. There is just one matter I would like to clarify on this: According to our present state law, both on the unemployment and on workmen's compensation, it is specific and mandatory that if you have three or more regular employees they must be insured through the Industrial Commission. It is not optional. You can't buy it any place else. You must insure through the Industrial Commission.

However, you fellows probably know this: These jerry-builders have got a brother and a son, or maybe a father and a son working together. Two or three of those fellows will work, and they will hire one or two bricklayers, and one or two carpenters, intermittently. But they don't have three regular employees.

Now, the result is—suppose they only hire two bricklayers. They haven't got insurance. They haven't committed an unlawful act, but the bricklayers that are working are without that protection.

The law does permit an employer with less than three employees to be covered voluntarily. I am insisting on this in my organization. I don't give a darn if a sub-contractor comes to me with only one man, that man has to show me a certificate of insurance up to date from the Industrial Commission before I let his one man work on the job.

Mr. Naumann: We have that particular clause in our rules. We don't care if a man only employs one man, he is not permitted to go to work unless he is protected.

We try to follow through on that. But there are so many holes being dug and so many builders that it is hard for anyone to keep up with it, much less your inspectors that are in the field. We who are in the locality can't keep up with it.

Every five minutes there is a new builder. They are just about as frequent as your accident rate. It is a hard matter to overcome under present circumstances, but by the cooperation of everyone concerned it can be overcome.

I would also like to refer for a moment to the statement that Mr. Jockel made relative to the regional offices that were established for the reporting of these men in their vicinities at 8:00 o'clock in the morning. I also heard that some time ago.

I don't know whether it is in effect yet or not. If it is, it appears to me that there is a streamlining effect going on within this division that is not an efficient one. It is becoming costly. It means the establishment of men in those offices, and it takes time away from the men in the field.

I also think, as Jack does, that there is a tendency for this department to become a political grab bag. I think that we, employers, the contractors, and the organizations, should do everything within our power to hold that intact as it is, to prohibit anything of that kind to happen. We don't want to be a political sub-division.

Chairman Pearse: That's right..

Mr. Naumann: We want to carry on as we have in the past. There is only one way that we are going to do it, and that is to insist on it through these sectional meetings that we are having, or this yearly meeting.

I believe that we should take action, as we have here on several occasions, by motion, or through these various committees, to insist to the commission that that is what this construction division wants. We want a clear cut case, as before without any political intereference in any sense of the word. In that way I believe that we can get somewhere and stay where we belong, or stay where we have always been.

Mr. Max Koblentz, Carpenters' District Council, Cleveland, Ohio: You know, Mr. Jockel's report, or Mr. Davis' report: Are they speaking about enforcing the law, or putting up posters, or something like that? I would question whether it is possible to enforce the law. How would you enforce the law? You tell a contractor that he will be

penalized six months after an accident, or three months after an accident, and at the same time you have accidents on his jobs.

I would suggest if a Safety and Hygiene Inspector comes on the job today and sees any violation and he tells the foreman or superintendent, or so and so, that this should be corrected, the next day the Safety and Hygiene Inspector should be on the same job to see that that is done. If it isn't done, call a policeman. You should see how they are all afraid of a vest button, and especially a small contractor. They will correct their violation.

At the same time, the Safety and Hygiene Inspector wouldn't have to be 30 days on the job. He would have to be two months on the job. He would know that this thing was corrected.

The same as regards a permit. If there is no permit on the job, the job is stopped.

On some jobs where they figure a job, the contractor, or the superintendent, or the general foreman, they want to contract the job for so much less. There is a little thing, a railing or a cover on air ducts, or something like that, that they pass by. If some carpenter, or somebody, tries to cover these the superintendent will say, "Oh, what are you doing? Leave that go."

All the laws could be enforced if it is possible to get the inspectors of Safety and Hygiene to get in touch with any city police, just the same as if they haven't got a permit. If it isn't enforced or corrected the next day, stop the job. They are always afraid of a vest button.

Don't think for a moment that the steward could do it. Some times the steward can't do it.

When the Safety and Hygiene inspector comes on the job, and he knows the contractor very well, he can talk to the contractor more than the steward can talk to him. He can say, "Hello, Jimmy," and they go out in the corner and they talk together.

The Safety and Hygiene inspector means well, but he comes 30 days later. He ought to come the next day, and if it isn't corrected, call the police and stop the job. That's the only thing to do. Then he won't have to come every 30 days. Every two months will be all right. Then, the contractors will know from each other that his job was stopped because of that.

Chairman Pearse: There are a lot of things we can do as we go along.

I am going to appoint one more committee with your permission. I am going to ask Mr. Naumann and Mr. Stocking to be a committee, Mr. Naumann chairman, and go over to the Industrial Commission and try to get that very thing you were talking about of making a political organization straightened out. See what you fellows can do from the employers and from the laborers' standpoint.

There you are, gentlemen. If there are no objections, that is my third committee.

Mr. A. R. Taubman, Division of Safety and Hygiene, Cleveland, Ohio: Mr. Chairman: I am not going to say anything. I am just going to tell you that I am going to give the boys who only get in here once a year a chance to express their views.

STATEMENT OF MR. RICHARD V. JACOBY

Marietta Concrete Corporation,

Marietta, Ohio

I am Richard Jacoby from the Marietta Concrete Corporation. This is my first year. I have been listening and trying to learn something. This meeting this morning has certainly been an inspiring one.

We aren't in the building contracting business. We try to avoid contracts as much as possible. Most of our business is concerned with jobbing material. But in order to get anything done, we find that occasionally we have to branch out and do a little contracting on our own.

We have had a few industrial cases that have been headaches to us, and we have learned a lot, and we have had a few penalties. That happens every once in a while.

We find that our men, some of them, are careless. We have what we call a silo erection crew that goes out on the road to erect silos. They might be called independent contractors on their own. Yet we carry them on our payroll as employees of the company.

We find that our biggest problem with them is scaffold work, the use of their scaffolds. We could furnish them with the best scaffold, I think, that anyone could furnish them with, and if we didn't follow them around they wouldn't use it. They will figure, well,

Mr. Sullivan: That's right. They belong to each of the individual contractors here in Columbus.

Chairman Pearse: I would say that contractor has to carry insurance on them.

Mr. Sullivan: I want to carry it back to them next summer.

Chairman Pearse: I would say you are covered by the contractor's insurance. We have apprentices, and we always cover them the same as other men.

Mr. Sullivan: That is my opinion, but Mr. Knight of the School Board wouldn't commit himself, and neither would any of the contractors who were there. I thought I would bring that question here. My interpretation is that they are actually covered, because they are still in his employment.

Mr. Milan Stocking, Executive Secretary, Cleveland Chapter Painting and Decorators of America, Cleveland, Ohio: Well, Mr. Chairman, the apprentice program is practically uniform throughout the state. The employer pays that boy. He pays him while he is on his own payroll. He pays him while he goes to school. He should pay him at least. Therefore, he is in the contractor's employ, and it should be a violation if the contractor failed to return his payroll along with that of the others. He is absolutely covered.

Mr. Ross F. Johnson, Hunkin-Conkey Construction Company, Cleveland, Ohio: I have one suggestion. You were talking about these placards and folders. My suggestion is this, that we try to obtain some actual photograph pictures to put on these placards with a reference at the bottom to the section in Bulletin 202. Have nothing else on there.

These placards we are getting now are lifeless, and they should be livened up by some action pictures, if possible. And then put a specific reference to Bulletin 202, so that it will at least attract attention to the specifications in that bulletin.

Chairman Pearse: Well, that might be a good idea. I will just add you to that committee.

Mr. R. C. Schwarzer: I might say that I believe that these pictures of accidents will be taken on the job, because our division has established a visual education program having to do with photography. I believe we will be having those kind of posters on the job as soon as these boys get completely organized.

Mr. B. T. Godfrey, Division of Safety and Hygiene, Columbus, Ohio: Mr. Chairman, I do want to make a few remarks in reference to what has already been said this morning and the committees that have already been appointed.

You have this morning appointed various committees. Now, as an employee of the Division of Safety and Hygiene, I hope and trust that those committees will function, will get out and do the job which they have been assigned to do and not go back home and forget about it. I know some of you will. I hope all of you will, because that is the thing that is going to get us results.

I am talking now from within. I happen to know something about the conditions and circumstances in which we work. I think every man in the construction section is doing a darn good job with what he has to do it. I think our codes, our specific regulations could be greatly improved, could be made more definite, either say yes or no. I'm not a man that wants to go around the stump and put in an exception over here. It is either right or wrong. And when we get down to that old black and white stuff, we are going to be able to do something.

I hope the employers and the labor representatives that are here in this sectional meeting will bring pressure to bear upon the Industrial Commission of Ohio to make our division more effective in accident prevention.

There are a lot of things I could say that in my opinion would improve the work of the field men. I think you have made a great move here this morning in appointing these committees to study and bring out the weak points and make them stronger, so we can go out and do something to save life and limb of the working men of the State of Ohio.

I would like to make a few remarks off the record, please.

(Discussion off the record.)

Mr. Arnold Bill, Division of Safety and Hygiene, Columbus, Ohio: Arnold Bill, Safety Representative in the Division of Safety and Hygiene on Building and Construction Operations.

There are a lot of things that I would like to say here. I want to say a few things here to you men this morning, but I would like to say them off the record.

(Discussion off the record.)

Mr. Charles H. Walker, Carpenters Local 1138, Toledo, Ohio: I just wanted to say on this Bulletin 202 that when it was received we got a few copies of it in Toledo

and we took up the sections that we were vitally interested in and read them off in the meetings, in open meeting, section for section, and had discussions on them.

Also on those safety cards: We have them made out in triplicate form. One is furnished the contractor, one the employee, and one the State, so that they have all got a copy of it signed at the time of the accident. We have a very live safety committee that works all the time, and they follow all of these up. I think that is a matter of record over there at the Commission.

Mr. Fred H. Watson, Safety and Hygiene Division, Toledo, Ohio: Off the record.

(Discussion off the record.)

Chairman Pearse: If you fellows that are here will go back and tell your unions and your employees, and your association what you have learned here this year, if you have learned something, I think it will help in some way. If we save just one or two lives we are doing something. I think it is worthwhile. God knows none of us want to see a man hurt.

Mr. John W. Jockel, Secretary and Treasurer, Ohio State Conference Bricklayers and Masons and Plasterers International Union, Cleveland, Ohio: I just want to clear up a few things.

You appointed three committees. I would like to make a suggestion that these three committees go to and see the Industrial Commission all at the same time. We are all interested in the same thing. We are going to get knocked around if we go one at a time. I have been over there so often, and I know just how they handle you.

You appointed a committee to go to the Industrial Commission to give these men police power. The Safety and Hygiene has no police power. They are what you call educators. If you go over there, they will tell you they will have to change the law. The police power rests in the Department of Industrial Relations. Now, they have police power.

A fellow goes out and there is a violation, he must call up the Chief, and the Chief says so and so, and it is too late. Police power belongs to the Department of Industrial Relations.

So I would like to suggest, Mr. Chairman, that these three committees get together and go over at the same time.

There is one thing that is settled for good. I have been working on it for a long time. I called on Mr. Morrow, Mr. Sain, and the Industrial Commission individually, but there was nothing done about that digest of the code. Mr. Davis, told you that he saw Mr. Morrow and he has the material there. I looked it over and he asked me to approve it. It is all right. So we have come to the conclusion now, gentlemen, if you want this miniature code we as labor and employers must buy it ourselves. We are just a voluntary organization. We can't do anything compulsory. But as far as I am concerned, if the employers of Cleveland will get a miniature code out that will affect important trades, and give them to their superintendents, foremen, which they agreed to do—they did that some years ago—I would like to ask the committee here today of the laboring men to go back to their organizations and ask their organizations to buy some. I am going on record today that we will buy 500 in the bricklayers, and I will recommend it to our convention. We will maybe take 1,000. That will be $100 at ten cents apiece. I think we can take care of 1,000.

Now, how many of you fellows are willing here today to go back to your organizations and recommend that we take these codes?

(A number of the representatives of unions indicated their willingness to go along with the proposal).

Mr. Milan Stocking, Executive Secretary, Cleveland Chapter Painting and Decorating Contractors of America, Cleveland, Ohio: Mr. Chairman: First a question.

Mr. Jockel has spoken on one question I had in mind. Also, Mr. Jockel recommended or at least threw out the suggestion of forming a special organization that would meet oftener and be more effective in safety work. I wouldn't like to see this meeting adjourned without giving that question some consideration.

In respect to the miniature safety code: I am not satisfied that we are getting anywhere unless we go farther than we have gone right now. Somebody has said, "Well, we will take hold of it voluntarily." We should have something more than that. We should have somebody that is actually taking the responsibility and taking the necessary steps, because it should be gotten out quickly.

Now, I am not satisfied, either, that the answer of Mr. Morrow is the final answer. We are facing the biggest building boom that we have ever seen, which means an influx of many new workers, many new contractors, and many of them will not have the skills or

the experience that the old, established groups have had. I think that the Industrial Commission should be interested in some special measures, and I think they are justified. If this miniature code is important, even if it does set a precedent for many others, why shouldn't they also have copies of the code? Everyone is theoretically entitled to a full copy of Bulletin 202. They run out of them temporarily, perhaps, but it is going to cost much more to print that Bulletin 202 than to print a large number of condensed versions.

For the painters, I will say that we have had for three or four years a condensation which we are using and have used. So, we are taken care of so far as the painters are concerned or the State. It is an excellent thing. It should have wide distribution. If it means anything at all, we should get them into the hands of people and have them handy and have them carry them around in their pockets, and use them. It keeps the contractor out of trouble, and it will certainly help the worker, because if he knows something about the rules, he is going to be more careful, too.

Chairman Pearse: Thank you, Milan. I think our committee can work on some of your ideas when they go over that. You three chairman get together and fix it up.

Mr. T. E. Waller, Secretary and Business Representative, Carpenters' Local Union No. 200, Columbus, Ohio: Mr. Chairman, are you about ready to close? I think our chairman has done a wonderful job. I think we should give him a big hand.

(Applause.)

(Thereon the meeting adjourned.)

FOUNDRIES SECTION

Wednesday Morning Session, April 17, 1945

This session of the Foundries Section of the All Ohio Safety Congress was called to order at nine-thirty o'clock by Mr. Allan Cleaver, Newark Stove Company, Newark, Ohio, Chairman.

Chairman Cleaver: Good morning, ladies and gentlemen. It is gratifying to me to act as your Chairman for the first post-war Foundries Section meeting of our All Ohio Safety Congress.

I would like to at this time appoint a nominating committee who will nominate your officers for 1947. I would like to nominate Mr. H. L. Pollock of the Ohio Brass Company to serve as Chairman of the Committee; Mr. C. K. Ferrell of the Cooper-Bessemer Corporation; Mr. John Lacey of the Commerce Steel Castings Company. They will report their findings at the end of this meeting.

In the past, especially in our last meeting, we have had excellent talks on silicosis. Today we are going to talk about and discuss one method of reducing this hazard, or eliminating this hazard, by foundry ventilation.

Our first speaker, Mr. John M. Kane, who is Chief Engineer of the Dust Control Division of the American Air Filter Corporation, has most recently written several swell articles in Foundry Magazine. I am sure most of you have read them, so, without taking any more time from our meeting, I would like to introduce at this time John M. Kane, Chief Engineer of the Dust Control Division, American Air Filter Corporation. Mr. Kane.

FOUNDRY VENTILATION (ILLUSTRATED)

Mr. John M. Kane, Chief Engineer,

Dust Control Division,

American Air Filter Company,

Louisville, Kentucky

Mr. Kane: Gentlemen:

Last week I was at the Greater New York Safety Meeting, an assembly about the same size and magnitude as this group. The chairman of the meeting was a chap whom I knew very well, and with his brutal frankness he warned the audience ahead of time that I had considerable of a reputation, not for my speaking ability, but my main demand was for my collection of lattern slides. So consequently I am going to be very, very brief with my remarks.

I hope too many of you haven't read what I have recently been talking about in Foundry Magazine. If you have, why, it is going to be old to all of you.

Foundry ventilation to a ventilation engineer is one of the most interesting of the various dusty industries, which encompass practically all types of production. No two foundries are alike. Your problems are complicated by so darned many different angles that all we can do in a discussion of this type is just highlight the things that you probably will be more interested in, and the things where the problems are somewhat in common between the small foundry and the large mechanical foundry; between your non-ferrous, your ferrous, whether it is gray iron, malleable or steel.

We have always heard—and there is a general impression—that foundries are a dirty, dusty, unsatisfactory place to work. From my observation of dusty industries—which has been going on for quite some time, now—I think I can say that in the foundry industry I have seen more progress in cleaning up dusty conditions within the last five years than any other industry with comparable dust conditions has made, that I know of. So don't let people say too much against your efforts. There is a lot of stuff still to be done, but the general method of attack of the foundry men has been the type that is going to take care of the dust problems that are still giving us considerable trouble and giving industrial hygienists considerable headaches.

In my lantern slides I am going to start out and just roughly review certain phases. There is no need of my telling you how to control dust from a grit blast room. It is a standardized thing. You have been doing it for years. It is an excellent way that you do it.

So, I think now we will just darken the room slightly, move the screen into place, and we will get into the meat of the discussion.

(Slide) In the Control of any dust in industry, whether it is a foundry or any other plant, there is one fundamental that you have heard repeated time in and time out, and yet it can't be overemphasized. That is the only way you are going to prevent any material that the industrial hygienist likes to call a "contaminant" from getting into an atmosphere or workroom, by picking up that material at the point that dust is generated.

Once material, whether it is dust or smoke or fumes, gets an opportunity to disperse to your workroom, it is just like tobacco smoke. It penetrates over your entire plant, and you have to turn your plant inside out, if you are relying on ventilation, and you still get poor control.

If you can control the dust at the point where it is generated from a process, the total volume of air you need is small, the installation is positive in its reaction, and you have kept all of your material away from the breathing zone of your operator, which is your first reason for going to exhaust ventilation.

In foundry work you will find exhaust ventilation is the solution or the fundamental working tool in controlling most of your dust problems. The exhaust system, or your ventilation work, doesn't do the job completely. You have housekeeping, education of your workmen. There are certain operations where the application of ventilation is still a very difficult—sometimes almost impossible—problem, unless we do major changes to the particular job under question.

Occasionally in those places you have got isolation, or respirators, as the only temporary stop-gap or protective measure that you can use.

To illustrate the first command, then, in dust control, I have shown here a picture of a typical electric melting furnace in a steel foundry. General methods of preventing the smoke and the dust and the fumes from an electric melting furnace from permeating the entire working area, molding area of your foundry, has been to put ventilators up in the roof. You can see how far away the roof ventilator is from the point where the smoke is emitted from the furnace. It means that to prevent a drift, exhaust volumes up through your roof monitors are frequently in the range of 80,000 to 100,000 cubic feet of air a minute.

In spite of volumes that large, which even in Ohio represent heat load loss, you will find under certain weather conditions a tendency for the smoke still to drift, causing a haze through your molding floor.

(Slide) If for a moment we take that same melting furnace and put a hood or a local exhaust ventilation application at the point where the smoke escapes from around your electrodes, around your slagging door and your pouring spout, you have completely prevented all this dispersion up into the workroom, where it gets a chance to drift through the rest of your foundry.

All you have to do is maintain an inflow of air through relatively small openings, and an exhaust volume of 10,000 c.f.m. will do a far better job than 80,000 to 100,000 way up in the air, as seen on the previous slide.

That, fundamentally, applies all the way through any dust application. Every square foot of sheet metal you can put between a dust producing operation and a workman, it is that much more positive your control is going to be, that much cheaper the cost of your control installation.

(Slide) One of the most difficult problems, due to the wide variation in shake-out procedures, is the foundry shake-out. You can see that you have everything against you. Your castings are hot. When you break your flask you get a release of gases. You have the thermal or stack effect from your hot castings, and you have fine burned sand tending to disperse vertically upward, and soon disperse and permeate the entire area that is exposed to the shake-out station.

If all our castings were small, and if all our foundaries were completely mechanized, the foundry shake-out problem would be "duck soup." All you have to do is build a doghouse over your shake-out, have an opening on the casting conveyor side where you upset your flask, an opening on the castings discharge side where your castings come off your vibrating shakeout grate. Control on such a thing is obvious and elementary. Maintain an indraft through the casting discharge opening, maintain an indraft through the opening where you upset your flask, and nothing can get out.

With the doghouse, with velocities of 200 to 300 feet a minute through these openings, you can control a shake-out, say, four by six, with a volume as low as 2,000 cubic

feet of air.

Unfortunately we don't do that in too many foundries. Otherwise, we wouldn't be talking about shake-out problems, but it offers an ideal approach to a problem, to just enclose your operation as completely as possible and then start cutting away the places where you can't have that enclosure without interfering with the operation, and you will come close to having an effectively designed exhaust hood.

(Slide) In the next step we have done exactly that. Our flasks are larger, they are upset on to the shake-out by a man on each side, so you had to cut away the front side. The casting being larger, you had to make your castings discharge opening larger; but bear in mind we have still got square feet of metal through which no dust can disperse. We have got a hood over the top, which is the natural path that the dust and smoke would tend to travel, and again we can keep an inflow of air through those openings and control the shake-out of that type with nominal volume of air. As opposed to 3,000 on the first slide, with a complete enclosure, it would probably be 6,000 to 7,000 with a cut-away section as much as that.

(Slide) Unfortunately, many castings have to be brought to a shake-out with an overhead crane. As soon as that enters the picture your complete enclosure, for your overhead hood, as we called the previous two designs, is out the window. As soon as that happens, you do the next best thing. You just go back to our preliminary concept of building a house around the shake-out. You know your crane has got to bring that flask in so you can't have anything beyond a reasonable distance from the center line in the way of overhead projection. Your workmen have got to operate on the front side, at least—frequently on the sides—in the flow of the flask and the castings from the shake-out. A side hood is probably the most satisfactory general application for a large foundry shake-out. Put the hood on the long side. Extend the hood as far over the shake-out as you can without interfering with your chain slides. Your exhaust volume, obviously, has to be much more than your enclosures that you could use on the previous installations. That particular unit is a six by eight shake-out and volume involved in a shake-out of that size would be in the neighborhood of 30,000 c.f.m.

It is a little interesting commentary on foundry men. Once they get "hepped" up on a subject they want the works. Lesser volumes than you normally encounter in foundry shake-out could be used from the industrial hygienists' viewpoint. In other words, some smoke or dust could be allowed to spill out of the exhaust zone, and still your dust counts would be within what we call threshold limits. But the foundry man, once he gets a job in, he doesn't want any of that halfway stuff. He wants to see all of the visible dust and smoke being picked up by the exhaust system, and that is the criterion; and when you have a criterion of that type, you don't need an elaborate dust counting technique, an elaborate survey of that operation, because when you are controlling the visible material the chances are very rare that the very fine one to five micron particles we are all interested in wouldn't take the same path as the visible particles. You remember, it is much harder to deflect a baseball than it would be a balloon or a small object by the airflow that is causing this dust that wants to rise vertically to turn over to the side.

The practical foundry man looks at a side hood of this type and he says, "Boy! That is a pretty picture. That picture must have been taken within one day of the time it was installed, because my crane operators would have knocked it over two days later."

I think that we have enough experience—by "we" I mean the foundry industry—to verify that a hood of this type can be constructed and will stay in position for years. True, it won't be pretty. You will get a distortion where the chain hook grabs on to your bumper rail, or you will get a swinging flask that will batter in your quarter inch plate, but it won't destroy the effectiveness of that hood.

The reason we are so insistant on trying to get a hood at this point, rather than the universal suggestion of foundry men, "Why don't you pull down-draft? Then I won't have anything above my floor line. I won't have anything to interfere with my casting flow."—is for this reason: Look for a moment what happens on a down-draft. All your dust wants to go up. The point of dust generation on a large flask may be three feet above the shake-out. You are pulling air downwards through the grate, which is attempting to make a velocity particle moving in an upward direction do an about turn. What happens is that most all of your air sneaks in right around the grate. It never influences the airflow picture up where your source of maximum dust generation is.

Then you get a big flask on your shake-out. Just the time you need the air the most, you have got sand spilling out of your flask, covering up your shake-out, blanking off your exhaust connection through the grate, or you use your shake-out hopper as a surge bin to even out your flow to your sand preparation equipment.

Soon your shake-out operator, your craneman, has pulled too many flasks and he has

got a shake-out hopper filled right up to the brim and all you use your exhaust system for is a sand conveying system, and that is an expensive and poor way to convey sand from a shake-out hopper.

(Slide) The picture that I just showed on the previous slide could be represented by this diagram here. The one difficulty with slide hoods on a shake-out, or the difficulty with any exhaust system where the operation is not enclosed, is that such operations are subject to disruption from open doors, open windows, cross-drafts, convection currents. In other words a pronounced flow of air due to an open door, moving in this direction (indicating) makes it very difficult to prevent dust from drifting away from the shake-out the same way.

You can put a side shield, frequently, on one side—just a vertical baffle or barrier—and look what it does to your velocities. Instead of dropping off, the velocities in the corner of your shake-out, instead of dropping off to particularly ineffective quantities, it evens that out so you get as good control at your corner as you do in the center of your shake-out. In addition to that, it prevents cross-drafts from sweeping over that shake-out grate and interfering with the general pattern of air movement you are trying to maintain into the shake-out area.

(Slide) When you get into large shake-outs, the exhaust hood for that (indicating) shake-out was quite large. I think the shake-out was about 24 by 18. It is almost necessary to provide side shields or wings that would enclose the large shake-out with a "U" shaped enclosure.

When you get into castings of that size, that is not so difficult because your handling of a casting is slow. You are not on that rapid cycle you are with a small flask, and invariably you can move that casting into your shake-out and still maintain ample clearance on all sides of your shake-out for your shake-out crew.

More and more of our larger shake-outs are being exhausted by local ventilation, but when we looked at those same shake-outs seven or eight years ago we threw up our hands and said, "It just can't be done."

(Slide) I have concentrated so much on the shake-out operation because it is the one that is giving the foundry superintendents the most trouble. It is difficult for him to see in any ventilated shake-out anything that is exactly like his, either in the location of the shake-out or his flow procedure to or from it.

In the sand handling or sand preparation plants, there is no need of dwelling very long. Your foundry equipment manufacturer has gone to extremes in giving you a design of equipment that permits economical control.

Your elevator is completely enclosed. All you need is an exhaust at your elevator boot, a slight ventilation at your elevator head to prevent condensation in your housing, and there you have it.

Your sand screen is a beautifully enclosed job. All you have to do is keep enough air moving through the slit openings and no dust can get out from your cylindrical or your vibrating screen.

In fact, it is the foundry equipment men that have been installing elevators and conveyors and bins and screens, in their industry that have shown people engaged in other material handling—the ore mining and crushing fellows—how to control dust. Instead of being backward, we have found you people have been the leaders in a number of dust collecting and ventilation applications.

The mixer (indicating). I know of no mixing equipment in the chemical industries and in the baking industries where dust hoods are so consistently supplied as you get in your foundry industry. Once you get an enclosure, then exhaust ventilation is just clear-cut. Find out how much opening the dust can get out, keep an indraft of 150 or 200—in extreme cases 300 or 400—feet a minute, and you have got that problem completely controlled.

(Slide) We have just very quickly gone from the shake-out, followed the sand rapidly to your sand preparation plant, and obviously in your mixer you add water to your sand, bring your moisture content up, and it is very rare that you will have a dust exposure as your conditioned sand is returned to your molding stations. It is on very rare occasions that we even think of following the sand after it leaves the mixer.

Here (indicating) I am going to jump over the cleaning room and, as I intimated in the opening remarks, I am going to by-pass abrasive cleaning, going to by-pass it for exactly the same reason as I hurridly went over your sand preparation plants.

For years you have been applying exhaust ventilation to grit blast rooms, your abrasive cleaning jobs, your tumbling mills. Incidentally, you have been using it not only to prevent dust escapement but to speed up and help your operation, keep your abrasives sharp, give visibility so that the operator can see what he is doing in a grit blast room.

A little remark there that might interest you. I don't care how much air you pull

from a grit blast room, you will never keep the concentration sufficiently low so that it would justify an operator in a grit blast or sand blast room being in that room without positive pressure mount. As far as dust control is concerned, you would use a lot less air than you would use in abrasive cleaning, in grit blast or sand blast rooms. The volumes have been selected to carry the dust away fast enough so your operator can see what he is doing.

Tumbling mill is the same story. Your air volumes that we specify for tumbling mills are far above what you need for dust control, but you want to get the sand rapidly of that mill to give your stars impact against the casting without a cushion effect.

Grinding wheels are in the same category. The way to control a grinding wheel has been known for at least 40 years, and the thoughts on grinding wheel exhaust haven't changed very much in that 40 years as far as your hood is concerned, which is a combination guard against wheel breakage and an excellent way to make exhaust air flow over the open or working edge of the wheel and carry the dust into the exhaust system.

The reason for talking about grinding wheels is its particular significance in Ohio from the standpoint that you do have a state code that says you need five inch hood section in your branch connections.

Hood suction, quite contrary to most of your opinions, is not a judge of whether a job is good or bad. It is simply a measure of what the velocity is in the branch duct and the ease with which that air gets into the branch duct. If we consistently followed the five inch hood specification we would have to use conveying velocities in a branch from a grinding wheel of around 8,000 feet a minute. The only reason for using the velocity is to prevent dust from settling out in your duct, to convey it to your exhaust or in your dust collector, when in practically every state in the Union it is permissible and satisfactory to convey that with velocities of 4,500 feet a minute. In fact, your A.F.A. Code has been adapted as the American Standards Association code for exhaustive grinding wheels and specifies 4,500 feet a minute.

It means that people in Ohio, if they insist on five inch hood sections, are just causing rapid wear on the ducts due to that unnecessary velocity for carrying your dust along, increasing your power bill to move the same volume of air by about 30 per cent, and it is just one of those unfortunate things of what probably under present day thought is an obsolete, incorrect requirement; sometimes being in existence because we are a little bit reluctant to get going and have something brought up to the present day standards.

There are several states where the same situation prevails. Illinois, just several years ago, now, eliminated that same situation by adopting the A.F.A. Code. Michigan, Wisconsin, and Ohio are the three five in hood section states till left in the Union.

(Slide) In your cleaning room, unfortunately you have grinding operations other than from your two wheel grinding or snagging pedestal. For a long time we have simply ignored the portable grinder. There is a good reason for it. The average man with a portable grinder operates over a large area. His wheel is small and you don't see a lot of sparks flying like you do from a snagging wheel, and you forget he is probably creating as much or more fine dust than you get on an average 24 inch diameter snagging wheel, with a man cutting metal more rapidly but removing coarser particles. You are going to find increased emphasis on control of portable grinding operations, and there are a number of ways to do it.

You can use nothing but a grinding worktable, pulling a flow of air downward through the grill to pick up fine dust generated by your portable grinder. I am sorry this (indicating) happens to be a die sinking job, but the same thing applies with a conventional six inch or eight inch wheel of the normal flexible grinding you encounter in your cleaning room.

Shields on the end of your benches and between your operators will deflect sparks that will tend to carry, stop their velocity, and they will be readily dropped down into the exhaust system. Your heavy particles can be made to drop out here (indicating) so that you need low velocities, low horsepower, to get the exhaust of the fine dust from the boot up and out to your dust collector.

(Slide) On your larger castings, I think, sooner or later, you are going to go to booth type enclosure. This booth (indicating) is a propeller grinding booth, but the same thing applies to your foundry cleaning room. Once you put those propellers into a room with an operator by himself, you give the operator all the leeway and the flexibility he requires. He could grind with his wheel in any position. The inflow of air, just like in your spray booths, would keep the dust from getting out into the remainder of the room. Sparks cannot be deflected into the operator, and you have an orderliness and a cleanliness that you don't get until you go after your portable grinding operations.

With your larger castings your booth undoubtedly would be slotted, so that you

could deliver your castings to your cleaning room, your grinding room, either with overhead or monorail cranes. It would affect in no way the feasibility of the installation.

Booths of that type have another interesting possibility. They can be made out of acoustic material and cut down the noise in your cleaning room appreciably. That is another thing that your industrial hygienist is going to concern himself with more and more in the future.

(Slide) Let's not forget the swing frame grinder. For years companies that manufactured the grinders and dust collecting people tried their darndest to pick up the dust from a swing frame wheel right at the wheel. Gentlemen, it just can't be done. The booth type of enclosure, such as you see here, has been pretty well established as the satisfactory way of controlling swing frame grinding operations. You can spot your work outside the booth. It doesn't interfere with your material handling. Relatively low velocities of 150 feet a minute through the opening in back of your casting will be ample to control that fine dust that starts up from your grinding wheel. At about 45 degrees you get an action due to this stream of molten sparks that gives you higher velocities right at the point that you need them to take care of fine dust. I am sorry the slide is indistinct under this light but you can see the trajectory of these sparks, sparks of very heavy particles compared to the fine material we are so interested in, but you can actually see a spark tending to go up to the sky, being turned around in just about that area (indicating) and taken back into the room, and when you can do that with sparks you can do that with your one to five micron material, and that is one with a volume of 1,000 to 4,000 c.f.m. per swing frame grinder, which certainly isn't excessive.

That covers my illustration and pretty much winds up my song and dance.

I have intentionally overlooked a lot of problems that are special to one industry or another. I know that in my shake-out discussion I have skipped over a bit of—shall I call it jobbing or floor molding foundries?—where you do not have a centralized shake-out. We could talk about any of the specialized details you care to if there is time for it in the discussion, afterwards.

Chairman Cleaver: Thank you, Mr. Kane. Mr. Kane will welcome any questions you might have, or any discussion on any particular problem you have.

Dr. Emery R. Hayhurst (Columbus, Ohio): Do you have equipment that will take care of dust from refractories? brick grinding?

Mr. Kane: An excellent question. Bear in mind that every steel foundry has an abrasive cut-off saw that your masonary operator is using and creating a concentrated dust during a short period of time. The dust can be collected very simply and very easily and the type of hood and the type of collection equipment you would use would be based on two conditions: Is your masonary saw in a permanent location, or is it a portable job that you have to take from one station to another?

Preferably, use a stationary system if you can, and a booth type enclosure I like better than any local hood in back of the unit, because it gives the operator complete freedom, you know, to set his saw, to move his brick back and forth.

Dr. Hayhurst: Pardon me. I have in mind the pressing of the brick against the side of the grinder.

Mr. Kane: O. K. That is a different operation. Most of the jobs I have seen have been with the abrasive cut-off saw to size your brick. You find in the manufacture of refractory brick that that is a conventional operation where brick are held to specifications. You treat it just the same as you would on a disc grinder grinding steel. Increase your exhaust volume because you get much heavier concentrations of fine dust. Exhaust the same as you would with a disc grinder. Come up in front of your wheel as far as you can, come over the top, so that you have a slot where that refractory runs along the disc, and then your dust collecting equipment can be one of two or three types.

Your dust load will be heavy and your material will surely be abrasive. It is done in refractory plants. We overlook it in your steel foundries. It so often happens that at the time you are looking for dust problems, the abrasive cut-off saw isn't operating and you are apt to forget that that is one operator that is exposed frequently to a silicate dust in high concentrations, even if for intermittent periods.

Chairman Cleaver: If not, I would like to ask a question. We operate a stove foundry, and I think it is typical of all stove foundry operations where most of your work is small castings made on either squeezer or roller machines. Our molders shovel their sand out of winrows, and as they make their molds they regress back toward the back of the wall and we went along for several years without any silicosis, but now they are beginning to smack us down.

We were wondering what we can do to cut down or reduce the dust hazard in our shop completely turning the thing upside down. There is definitely a dust hazard, not only in the molding operation but also in the shake-out. The shake-out is done by hand with a shake-out saw and just put right back into winrows and we take the castings out and put the sand in.

Do you have any suggestions, Mr. Kane, on how we could help reduce that dust hazard?

Mr. Kane: Suggestions wouldn't be very satisfactory, because they can be done only in two general ways. One is the expenditure for a lot of equipment, changing completely your procedure of shake-out, and that means going to a centralized shake-out station. When I say "centralized shake-out station," I don't necessarily mean one station, but you will find a number of foundries confronted with your same problem that you are going to what I would call a semi-mechanized system. Your molds from the molding station are put on a conveyor, run down and poured on the conveyor, upset at the end of the conveyor through a floor grate, and, if the casting is small, casting and sand are carried along to a central screening or casting shake-out station. Where the castings are large you separate the casting from the sand at this dust station, but instead of dumping your casting, then, over an area as large as this room, in a comparable molding floor area you have six lines (indicating).

Now, the nice way--although I still don't believe you would get an operator to do it—you are actually only upsetting castings into one or two of those openings at any one time, and you are awfully tempted to provide exhaust ventilation only for two or three stations, putting cover plates on the others. The difficulty with anything that is left up to an operator—I guess we would be the same way if we were doing their job—will be that your cover plates are left off and your exhaust ventilation is of questionable use unless you provide ventilation to each one of these stations. Unless you are prepared to go to some extreme such as that—and it really isn't as extreme, probably, as it sounds at first glance— the only thing I know is to shake-out at night, cut your sand at night when you have got the fewest men possible exposed to your dust conditions. Wet your sand as thoroughly as the sand will stand before you shake out your molds. Give your shake-out crew respirators. Put as much general ventilation through your roof monitors as you can produce, and keep a check on your dust counts.

In other words, there are just the two extremes. One is stop-gap, pure and simple, because as long as you are making a dust condition over your entire area there is no way with reasonable exhaust volumes that you can keep your dust concentrations down to what we think of as acceptable limits.

If you do have a dust condition at your molding station during the operation of your molding machines, just a slight air movement from a hood in back of your molding machine will control that very effectively and inexpensively.

Chairman Cleaver: Thank you, Mr. Kane. That helps answer our problem. Our molding machines are portable. They work along a winrow, and I think it is common to a problem that most stove foundries and foundries that produce small job castings, furnace castings and things like that, are faced with.

We are doing our shake-out at night and we wet down our gangways, use liquid partings, and we are doing all we can to eliminate the dust problem.

Mr. Don Judge (Hamilton Foundry and Machine Company, Hamilton, Ohio): Mr. Kane, what is recognized as the most desirable number of air changes permitted for grit blast?

Mr. Kane: The present day standard is 60 feet a minute down-draft. That is about ten air changes a minute in an average room, seven to eight feet high. Bear in mind that it is purely a question of visibility. I have seen grit blast, particularly grit with a down-draft velocity of 60 feet a minute, where visibility has been perfectly satisfactory. I think that would be particularly true on operations where you clean scale or things of that nature, and don't have a heavy burned sand load.

I have seen some heavy duty sand blast rooms with sand as the abrasive, knocking off a heavy burned sand load from your castings or cores where 100 feet a minute down-draft would have been a lot better than 80. 80 is a generally accepted average.

In addition to that, you still have some air on your abrasive cleaner and your elevator head that takes your spent abrasive out and cleans it and returns it to your receiver.

Chairman Cleaver: In casting about for a speaker on Foundry Safety we finally got around to contacting a friend of mine up around Marion, Mr. John Lacey, and I asked him if he would suggest somebody to talk upon that subject. He said, "Yes; I know

just the man you want." He says, "If you can get Mr. Dudley of the Ohio Steel Foundry Company to come down and talk about foundry safety, he is the best individual I can think of."

So today, gentlemen, we have a man who is Secretary-Treasurer of Ohio Steel Foundry Company, who is quite a crusader for foundry safety. At this time I present to you Mr. W. P. Dudley, Secretary-Treasurer of the Ohio Steel Foundry Company, whose subject will be, "Foundry Safety." Mr. Dudley.

"FOUNDRY SAFETY"

Mr. W. P. Dudley, Secretary-Treasurer,

Ohio Steel Foundry Company,

Lima, Ohio

Mr. Cleaver, Ladies and Gentlemen:

When I came in here I was introduced back here to Mr. Kane, and he said to me, 'I am going to lead off on this program and I will conduct the preliminaries while the folks are coming in.' So I said to him, "All right, brother. If you can get them in, I will get them out." (Laughter)

Now, I assure you that what you have heard about me so far is gross exageration. I am not a safety man and what I don't know about safety would probably fill all the books that have ever been written on safety, because I don't profess to be a safety technician in any way, shape or form, and I assure you that if anyone expects me to answer any questions on safety when this is over, I am going to back out, because I am quite sure that in a meeting of this kind, comprised largely of men devoting their lives to safety work, that you fellows could tell me things that I have not dreamed of nor thought of.

I must of necessity talk on the subject abstractly and perhaps more from the standpoint of industrial or human relations than from the technical problems of safety, but I do hope that I can stimulate your thinking a little and leave something with you that is worthwhile.

In thinking about the matter, the first thing that I thought about was the question of why we have people like you gathered together studying this problem of safety. In other words, Why do we have safety?

Now, I don't know what your thought is. I do know this, that you continually hear safety emphasized from the standpoint of money and savings and dollars and cents, and there is no question but that at the present time it is costing more and more dollars to any company that is not following this subject and making improvements and doing everything they can to prevent accidents, because accidents are becoming more costly every day.

But is that really the fundamental on which you men are devoting your life? I don't think so. Somebody has said that all human effort is devoted to either the comfort or the progress of man, and a little analysis will prove to you, I believe, that that is generally true.

Last night I had the privilege for a period of an hour of reviewing with a man who works at our plant films that he took in travels throughout the entire world. The thing was brought home to me very forcefully as he showed me pictures of Chinese Coolies, the Chinese living in little river boats along the Yangtze River, who were raising a few chickens in a little chicken coop on this boat, who had a few pigs that they were always bring up, preparatory to selling on the market. He told us an interesting story about them. He said they bring these boats up to the shore and let the animals off, and when they get ready to drift back into the river they call them by names and the chicken or the pig hops back in the boat and away they go.

But those people are commercializing that effort. They are raising these things for sale to other people, and in so doing they are engaging in their own rough way in commerce, and they are preparing things for the comfort of the people who are not situated so that they can raise or grow their own, and in so doing they are also protecting their own livelihood and trying to provide for themselves such meager comforts as they may be able to get from their rough and crude efforts.

He showed pictures of Chinese farmers hauling to market two bags of rice suspended from a bar across their shoulders, trudging down the road to trade the fruits of their farms for the other things that they need.

He showed me pictures of Arabs milking their goats along the countryside, and the water carrier going through the streets of the cities in North Africa, making his meage:

"THE NEW INDUSTRIAL HEALTH REGULATIONS OF OHIO"

Joseph E. Flanagan, Jr., Industrial Hygiene Engineer,

Ohio Department of Health, Columbus 15, Ohio

Introduction:

Whenever a new code or set of regulations is proposed for adoption by an official agency of government, an immediate reaction may be expected. This reaction ranges from violent objection, through tacit acceptance of the inevitable to the less noticeable, but equally important favorable reaction of a small but well informed group. These reactions were expected during the development of the new industrial health regulations and they occurred. Some of the more important questions raised were the following:

"What authority does the Ohio Department of Health have for the adoption of such regulations?"

"What effect will these regulations have upon the payment of compensation for occupational diseases?"

"What are the penalties provided by law for a violation of these regulations?"

And last, but not least, was the question as actually phrased, "Who goes to jail first?"

There have been, and there are still, many misconceptions concerning these regulations and this discussion, today, will attempt to give you the basis for their establishment and to answer as many questions as possible regarding the regulations.

Historical:

The records of the Ohio Department of Health indicate an interest in occupational hygiene as long ago as 1886 when the first annual report of the Ohio State Board of Health announced the appointment of a Committee on Hygiene of Occupation and Railway Sanitation. The 1887 report included a section entitled, "The Effect of Occupation Upon the Health of Individuals." From 1910 to 1914, the Bureau of Vital Statistics of the State Board of Health published annual tables of occupation vs. causes of death. In 1913, the General Assembly passed two legislative bills; one, which authorized the Board of Health to make an investigation of occupational diseases and appropriated $7,000 for 1913 and the same amount for 1914 for this purpose; and the other, which required every physician in Ohio to report certain occupational diseases to the State Board of Health. This requirement, as amended in 1920, was extended to include several other occupational diseases and contained the clause, "and not excluding others," so that an overall reporting requirement was secured. The legislature also passed the so-called "Lead Law" in 1913 which gave the State Board of Health jurisdiction over the health of workers in industries which manufactured lead and certain lead compounds.

This early activity and legislation represented an extremely progressive attitude toward the recognition of the importance of occupational diseases in Ohio and, as a result of this legislation, a Division of Occupational Diseases was created within the Board of Health on May 15, 1913. This was the first such State division in the United States.

In compliance with the 1913 legislation (Joint House Resolution No. 12), Dr. Emery R. Hayhurst and his associates made a detailed survey of industrial health problems and occupational diseases in Ohio. The report of this survey to the legislature in February, 1915, covered 1,087 work places employing 235,984 wage earners, or about half of those industrially employed in the State. It is interesting to note here that, at the present time, there are over 2,800,000 workers and over 10,000 manufacturing plants alone in Ohio. The number of service industrial establishments exceeds 35,000.

Other activity of interest was the formation of the Ohio Industrial Commission in 1912; the designation of 15 specified occupational diseases as compensable diseases in 1921; the creation of the Division of Safety and Hygiene by the Industrial Commission in 1924; and the gradual extension of the compensable occupational disease schedule by the Industrial Commission until, in 1940, a final item No. 23 was added to designate, "All other occupational diseases," as compensable diseases.

The activity of the Ohio Department of Health from 1913 to 1936, in the field of industrial hygiene, was very commendable but was hampered seriously by a shortage of funds and, therefore, of personnel. From 1936 to 1940, the Department carried out a survey of exposures to toxic materials in industry and accumulated much statistical material. This activity was aided by funds from the U. S. Public Health Service by virtue of the provisions of the Social Security Act and approval of the subsidy by the Ohio General Assembly and by the then Governor of Ohio.

From 1940 to 1943, the Ohio Department of Health carried on no industrial hygiene activities other than a consulting service for the benefit of industrial nurses. In 1943, because of wartime conditions, technical experts were secured from the U. S. Public Health Service to assist the Department in this field. Wartime activities included a cooperative program with the Continuous Security Division of the Army, a foundry study for the War Manpower Commission, an intensive scientific investigation of the health hazards in the beryllium industry in Ohio, and handling of miscellaneous requests for service.

Development of Health Regulations:

Section 1237 of the Ohio General Code, in stating the general powers and duties of the Department, says in part, "the state board of health shall have supervision of all matters relating to the preservation of the life and health of the people. . . ." It has been painfully apparent that, although Ohio was one of the leaders in industrial health activities in the nation, the Department of Health has relied upon piecemeal legislation for a great many years and has not taken advantage of its primary responsibility to develop a strong coordinated and sustained program to protect the health of the industrial workers by attempting to minimize the occurrence of occupational diseases. The problem of occupational disease is one of the pressing problems in the field of public health and the existence of a working population of over 2,600,000 people in Ohio, plus the fact that Ohio generally is considered to rank fourth in importance industrially in the country, emphasizes the increased importance of the problem from the time of the orginal 1913 investigation. The importance is emphasized further by the large number of occupational disease reports which are made to the Ohio Department of Health each year, by the great diversification of industry in Ohio, and by the well-known fact that new materials and processes of which little is known are being introduced rapidly and continuously on the industrial scene.

An examination of rules, regulations and codes of other Ohio agencies also has shown that primary emphasis has been placed upon the prevention of accidents and that efforts to control occupational diseases occupy a minor part of the overall program. In the field of accident prevention, codes have been developed which are specific codes to cover specific cases; certain types of safeguards are provided for certain types of machines, etc. By means of such codes, industry knows exactly where it stands insofar as compliance is concerned and a good educational and enforcement effort has been made possible in Ohio.

The Ohio Department of Health is not, and cannot be, concerned with the field of accident prevention as such, but it is concerned with the absence of regulatory measures as they relate to the occurrence of occupational diseases, and with the advisability of establishing such regulations both for the protection of individual workers and for the guidance and protection of industrial management. The development of methods of procedure, detection of small amounts of toxic impurities in the atmosphere and the accumulation of information regarding the toxicological properties of many hazardous materials has progressed tremendously since the early days and in particular since 1930. The progress has been so noticeable throughout the country that approximately 15 states have adopted regulations for the prevention and control of occupational diseases which include a table of maximum allowable concentrations for various atmospheric contaminants. In some of these states, the codes or regulations were adopted by the Industrial Accident Commissions; by the Health Departments; or by the Labor Departments, and in a few cases joint jurisdiction exists on this matter.

In the latter part of November, 1945, the Director of Health of the Ohio Department of Health directed an inquiry to the Attorney General which requested advice as to the jurisdiction of the Ohio Public Health Council in adopting regulations establishing maximum allowable concentrations for substances dangerous to public health. In view of the duties laid upon the Department of Health by various legislative enactments in former years. A copy of the suggested regulations was attached to this inquiry. On December 3, 1945, Opinion No. 602 was issued by the Attorney General which states in its Syllabus,

> "The Public Health Council of the state department of health has authority pursuant to Sections 1232 et seq. of the General Code to adopt regulations establishing maximum allowable concentrations for substances used in industry which are dangerous to public health."

This opinion traced the origin of the original state board of health, the transfer of all powers and duties of the board to the present department of health, the creation of the public health council, and the duties of that council.

Referring to the duties of the council, Section 1235 of the General Code reads in part as follows:

"It shall be the duty of the public health council and it shall have the power:

(a) To make and amend sanitary regulations to be of general application throughout the state. Such sanitary regulations shall be known as the sanitary code."

In discussing the word "sanitary," the opinion reads as follows:

"The word 'sanitary' is a word having wider meaning than the prevention of the spread of contagious or infectious diseases. Webster's Dictionary defines it thus: "Of or pertaining to health; designed to secure or preserve health." While the law very naturally places emphasis upon regulations designed to prevent the spread of communicable diseases in view of the obvious fact that they may become epidemic, it does not appear to be the policy of the law to limit the powers of either the state or local health authorities to the spread of contagious or infectious diseases but rather to guard the public health in every possible way and from every menace."

Referring to Sections 1243-1 et seq., General Code, providing for the reporting of occupational diseases to the state health department, the Opinion says:

"Presumably the public health council will use this information as the basis for regulations to control and suppress the causes of such diseases."

This Opinion 602 also considered the powers and duties of the Ohio Industrial Commission and the Ohio Department of Industrial Relations and says in part,

"Accordingly, it is my opinion that nothing in the laws relating either to the Industrial Commission or to the Department of Industrial Relations, in any manner prohibits or limits the powers of the Department of Health through its public health council in enacting penal regulations of a general character designed to preserve and protect the public health, and in extending such regulations to cover occupational diseases."

The opinion also discussed the possible action of courts of law regarding rules of health departments. In one case cited in the opinion, the court discussed the question of the right of the legislature to delegate its lawmaking power to the public health council and declared the authority given to a public health council, and similar health authorities to adopt and enforce regulations was not an unlawful delegation of legislative power.

In view of the Attorney General's Opinion on this matter, a draft of the proposed regulations was prepared, distributed according to law, and a public hearing was called before the Ohio Public Health Council on January 13, 1946. At this same time, the Ohio Manufacturers' Association was notified with the idea in mind of securing consultation and advice from that group and their representative industries. Between this notification and the January 13th date, several conferences were held with legal and technical groups representing industry, with two large labor organizations in Ohio, and with private concerns interested in the proposed regulations.

As a result of this activity, the initial draft was revised and the hearing was held as scheduled on January 13th. At that time the Public Health Council recognized requests for a delay in final action and another hearing was set for February 16, 1946. During the one month period, we received only five suggestions for modification of the second draft, and on February 16th the Public Health Council approved the regulations to become effective on January 1, 1947.

Regulations:

As adopted at the February 16th meeting of the Ohio Public Health Council, the new industrial health requirements will become Regulations 244 through 250 of the Ohio Sanitary Code. Regulations adopted by the Public Health Council and constituting the Ohio Sanitary Code the force and effect of statutory law and a penalty fixed by law can be invoked for failure or refusal to comply with the provisions of such regulations. We will not attempt to read these regulations in their entirety but Regulations 244, 245, 247 and 255 are deserving of special mention at this time.

Regulation 244 entitled "Application of Regulations" reads as follows:

"These regulations shall apply to every place of employment and particularly to those places of employment where a work or process is carried on by which dusts, fumes, mists, vapors, gases or environmental conditions of a harmful nature are produced or generated, or exist independently of the work or process, which may be inhaled, or absorbed, or in any other manner enter the body in quantities or concentrations that constitute harmful exposure as hereinafter defined."

This regulation indicates the general applicability of these regulations and no further comment is necessary here.

Regulation 245 entitled "Modifications" reads as follows:

> "When strict compliance with all of the provisions of these regulations would involve undue hardship, the Ohio Department of Health may, upon application in writing, permit modification of the requirements when protection practically equivalent to that required by these regulations has been provided. The application for modification of any of these regulations in any particular case shall be accompanied by a full statement of the existing conditions and the reasons for requesting such modification. Any modification granted under the provisions of this paragraph shall be limited to the particular case covered by the application for such modification."

This regulation is a recognition by the Ohio Department of Health that no code or set of rules can be written which will cover each and every possible combination of circumstances which might arise. It also recognizes that, in some cases, a re-evaluation of a particular health hazard may be advisable in order to avoid an undue hardship.

The two introductory paragraphs of Regulation 247, entitled "Harmful Exposure" read as follows:

> "(1) No employer shall use or permit to be used in the conduct of his business, manufacturing establishment or other place of employment, any process, material or condition known to have an adverse effect on health, unless reasonable provisions have been made to prevent injury to the health of the employees and of the public.
>
> "(2) The concentration of dusts, fumes, mists, vapors, or gases, in the air breathed by employees shall not exceed the following maximum allowable concentrations for an 8-hour daily exposure."

Immediately following these paragraphs is a table listing the maximum allowable concentrations for gases and vapors, metallic dusts, fumes, mists and vapors, other dusts and fumes, mineral dusts comprising asbestos and free silica, and radiation. The regulation is then completed by an explanatory note which amplifies some of the important items such as sampling technique, analysis of sample, temporary concentrations in excess of those listed, the method of determining free silica and a statement on the method of dust counting.

This Regulation 247 is the most important single regulatory provision of the group. In order to administer this regulation, it is essential that exposure to any of the materials listed in the table of maximum allowable concentrations be evaluated on a quantitative basis. It gives industry and labor a series of reference points or levels which, if exceeded, will establish working conditions that are hazardous to the health of people exposed. It removes the evaluation of health hazards from the purely inspection class of activities. The values included are based upon the most recent information available from all of the states which have industrial hygiene units in either their health departments or their labor departments. At the present time, this means that we used the information obtained from two state departments of labor and from about 42 state and local health departments. In addition to these sources, reference was made to standards prepared by the American Standards Association, to toxicological literature as represented by publications like the Journal of Industrial Hygiene and Toxicology, to the practices of the Industrial Hygiene Foundation of America located at the Mellon Institute in Pittsburgh, and to the opinions of recognized experts in industry, and private research organizations. As a result of communications, conferences, telephone calls, and personal visits, many changes were made in this table before it reached its present form. One of the most important changes was the deletion of such items as gasoline, arsenic, monochlorobenzene, flourides, several glycols, slate, cement, mica, and talc from the table because there was not sufficient toxicological evidence to warrant their inclusion at the present time.

Under the Explanatory Note in Regulation 247, the section regarding temporary excessive concentrations deserves comment. This section (3) of that note reads as follows:

> "Temporary concentrations in excess of the maximum allowable concentrations listed shall not be permitted if exposure to such concentrations for a period of one hour or less may result in any adverse effect on health as determined by the Ohio Department of Health."

This section recognizes the fact that excessively high concentrations do exist for short

periods of time during certain industrial operations and that such short duration exposure may not be a violation of this regulation.

Section (4) of this same Explanatory Note states:

> "For the purpose of the above maximum allowable concentrations for silica, the free silica content shall be the per cent of free silica in the fraction of the air-borne dust in the breathing zone of the workers that is smaller than 5 microns in maximum diameter."

This method of evaluating the exposure to harmful free silica in dusty atmospheres represents a departure from the generally accepted procedure of most health experts. The most recent medical evidence indicates that only particles smaller than 5 microns in size are harmful as far as the possibility of producing silicosis is concerned. Analysis of settled dusts in foundries, potteries, etc., often gives different results than examination of the air-borne dusts in the same plant. By this method we will obtain a direct measure of the actual amount of harmful dust breathed by the workers. The analytical method involves the application of X-ray diffraction technique following a separation of the collected dust into fractions which are larger and smaller than 5 microns. The technique is not simple and the labor involved is considerable. The results, however, will be very much more reliable than have been those from former studies. This procedure will be identical to that used by the Industrial Hygiene Foundation of America.

Regulation 253 deals with violation of these regulations and reads as follows:

> "A violation of any of the provisions of the foregoing regulations or failure to comply with any orders made pursuant thereto by the Department of Health shall subject the person so violating or failure to comply to the penalties provided by law."

In connection with this regulation, we refer to Section 1247 of the Ohio General Code which is entitled "Prosecution and Proceedings." In effect, it says that the laws outlining the methods of procedure, courts, penalties, etc., applicable to local boards of health shall apply to the State Board of Health.

Ohio General Code, Section 4414, entitled "Penalty for Violations" states that an individual who obstructs, interferes with or omits to obey an order or regulation of the board of health shall be fined not more than one hundred dollars or imprisoned not longer than ninety days, or both. No one shall be imprisoned for a first offense, however.

Section 4415 of the Ohio General Code, entitled "Violation by a Corporation" establishes a fine of not more than three hundred dollars and also provides for the fine and imprisonment of any officer of a corporation having authority over the matter who permits a violation of a regulation.

These sections outline all the penalty provisions and need little comment, other than the fact that only the Ohio Department of Health can institute proceedings under these sections as far as these regulations are concerned.

The other regulations of the group are concerned with methods of control of atmospheric contaminants such as ventilation; with the use and care of personal respiratory equipment; isolation of hazardous operations; sanitation in the plant; and warning of health hazards.

Whenever possible, the control methods to be used in a given case depend upon the decision of the plant management. The regulations are not mandatory with regard to the type of control to be installed. The final judgment of the adequacy of control will be made only after referral to the mandatory provisions of Regulation 247, and to the specific maximum allowable concentration for the material concerned.

Referring to respirators, the Ohio Department of Health will approve only those devices bearing the stamp of approval issued to the manufacturer of the respirator by the U. S. Bureau of Mines. The use of any other so-called respirator where exposure to a toxic material occurs, offers a false sense of security to the worker, to the foreman, to the safety department and to management. We also will recommend the use of respirators only secondarily to good engineering control. They are for jobs of short duration and for emergency exposure which cannot be avoided at the particular time or place.

Administration of Regulations:

One of the keys to eventual success in reducing the incidence of occupational disease in Ohio is the intelligent administration of these regulations by the Ohio Department of Health. The fact that these regulations will become part of the Ohio Sanitary Code on January 1, 1947, guarantees that the Department of Health has a firmer and more specific basis upon which to act in this field than at any time since 1913. Former legislation has been partly devoted to the basic principles of control and partly to application of specific

control measures as illustrated by the old "Lead Law" and the regulation providing for the prevention of mercury poisoning in the hat industry, (Reg. 241, O.S.C.). The regulations discussed today provide for the evaluation of dangerous exposures in industry at large by the application of scientific methods on a quantitative basis. There are no exceptions allowed in the overall application of these regulations, and no organization other than the Ohio Department of Health will be in a position to administer these regulations.

Although some of the foregoing remarks may sound extremely dogmatic, it is not the intention of this Department to take these regulations into the field and start an intensive search for specific violations on a plant to plant basis, merely for the sake of citing the violations and imposing the penalties provided by law. It also is not the intention of this Department to limit its activities to the evaluation of the working conditions which are responsible for each specific case of occupational disease which is reported to the Ohio Department of Health, although reported occupational diseases will be used in a general manner to guide the Department in preparing its program because they indicate which industries are the most hazardous over a period of time.

It should be mentioned, at this point, that our work will have no connection with specific occupational disease claims which may be filed with the Ohio Industrial Commission. The fact that an occupational disease is reported to the Ohio Department of Health does not mean that a claim for compensation has been filed with the Industrial Commission and we are not interested, nor do we have any jurisdiction, in the claim phase of this work. The existence of these regulations also does not affect the procedure or methods of awarding or disallowing claims in Ohio.

The approach toward the control of occupational disease hazards will be based upon industry-wide studies in cooperation with industrial management and labor and, in many cases, with the assistance of technical personnel employed by industry itself. For example, much work is needed in evaluating hazards in the foundry, ceramic, pottery, steel, rubber, and glass industries and such work should be based upon industry-wide studies in order to accumulate data which are statistically significant with regard to exposure themselves and to control measures generally. Some of the studies may require cooperative ventures with other groups which are in a position to carry on necessary toxicological studies or ventilation studies. The program, as envisioned at this time, is in many respects a long-range program based upon a necessary cooperative approach by all concerned. Information which may be published in any given field will not divulge the identity of individual plants but will be valuable for general application throughout the industry concerned.

Individual requests from management, labor, individuals, and other state official agencies will also be a basis for activity in this field, but the self-initiated studies will comprise the largest part of our activity.

Reports will be prepared on all activities and will be submitted directly to plant management in all cases with the exception of requests from state official agencies, and in this case, a duplicate report will be forwarded to the management concerned. This would apply to instances where requests for service are received from the Ohio Industrial Commission and the Ohio Industrial Relations Department. Any departure from such a procedure will undermine the confidence which is necessary between this Department and industrial management and will be fatal to continued progress.

The Ohio Department of Health also will carry on an intensive educational program as part of its usual activities in the field of industrial health. This phase of the work is considered to be most important, and will be of such scope that it will include medical, nursing, and engineering activities as well as problems in the field of general health as they might be applied to the industrial population. It is our intention, as well, to utilize the conference or round table discussion approach to such problems in our various districts throughout the state both for the benefit of managerial, safety, and labor groups. In-service training programs can be established to train industrial representatives in techniques and methods of industrial hygiene where a plant is interested in establishing and maintaining an adequate checking system for its hazardous operations. Without an overall program of education, both management and labor groups could struggle for long periods of time before resolving differences where health hazards are suspected in their plants.

The preceding discussion of the regulations themselves, and the present discussion of the proposed administration of these regulations clearly indicates that the Ohio Department of Health is concerned with a field of activity which has become increasingly complex throughout the years. The administration of these regulations demands that the Department utilize the services of the most competent personnel that can be secured. There is very little room, for an individual who can qualify only as an inspector, and, if the level of operation is limited to inspection, the entire approach to this problem will be a complete waste of time and of the taxpayers money.

Experienced medical, chemical, and engineering personnel must be secured. The most direct and continuous contact with industry will be made by our engineering representatives located in district offices in Ohio. In this connection, we refer to a very definite and commendable limitation which is placed upon the Ohio Department of Health by the Engineers and Surveyors Registration Act passed by the General Assembly in 1933 and amended in 1935, 1937, and 1943. The following quotation is made from the act:

> "Sec. 1683-1. That in order to safeguard life, health, and property, any person practicing or offering to practice the professions of engineering or of surveying, shall hereafter be required to submit evidence that he is qualified so to practice and shall be registered as hereinafter provided; and it shall be unlawful for any person to practice or to offer to practice the professions of engineering or of surveying, in this state, or to use in connection with his name or otherwise assume, use, or advertise any title or description tending to convey the impression that he is a professional engineer or surveyor, unless such person has been duly registered or exempted under the provisions of this act."
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> "Sec. 1683-2. The term "Professional Engineer" as used in this act shall mean a person who, by reason of his knowledge of mathematics, the physical sciences, and the principles of engineering, acquired by professional education and practical experience, is qualified to engage in engineering practice as hereinafter defined.
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> The practice of professional engineering within the meaning and intent of this act includes any professional service, such as consultation, investigation, evaluation, planning, design, or responsible supervision of construction or operation, in connection with any public or privately owned public utilities, structures, buildings, machines, equipment, processes, works or projects, wherein the public welfare, or the safeguarding of life, public health or property is concerned or involved, when such professional service requires the application of engineering principles or data."

The provisions of this act have been adhered to by the Division of Sanitary Engineering of the Ohio Department of Health since its enactment in 1933, and the requirements for engineers to be employed in our Division of Industrial Hygiene will be no less strict in this respect. The Registration Act requires the individual to pass an examination in his field and also requires a minimum of four years experience following graduation from an accredited engineering college, university or technical school.

We will endeavor to employ registered chemical engineers for this work and industry and labor may be assured that the personnel will be the most competent and experienced which can be obtained in the field. Supplementary necessary services also will be available in the fields of medicine and chemistry to round out the picture. Additional services in the fields of nutrition, tuberculosis control, and venereal disease control also will be available through the respective divisions of the Ohio Department of Health.

This entire development is one more example of the trend toward specialization both in respect to industrial hygiene itself, and to the personnel necessary to carry on the required work. There are those who deplore such an increasing trend in life's activities, but, with increasing scientific knowledge of disease and their control, the field of public health has become too broad to expect any one man to be a master of its many arts, or to be a master of all phases of any one particular branch. Life is too short to expect such an expansion of individual talent, and, at the same time, to expect that a satisfactory job will be done in a particular phase.

The Ohio Board of Health had the vision to recognize the potentialities of the occupational disease problem as early as 1913 and we believe that the enactment of our most recent regulations concerning industrial health problems will place Ohio once again as a leader among the several states, and will constitute a significant contribution toward increasing the public's consciousness and interest in a matter which, in the long run, affects so many thousands of families in the State of Ohio.

Chairman Berkey: Mr. Ernie Beck, who has travelled year after year a lot of miles, who has shown so much interest in these meetings, is here again this morning and he's always got something interesting, something good to tell us. Mr. Beck, I wonder if you will say something at this time?

Mr. Beck: Well, we've heard a lot about static. It takes a man like Professor Beach to come here and tell us a few of the things that he's been studying on and I've been studying some of his works as he knows, and the boys in Akron have been closer to

Professor Beach than I have because I understand he has spent many hours in Akron on this problem of static control.

We have fires in industry and we have fires in the rubber industry, many of them, but what pleases me is the controls that we have over those fires. In other words, it's not what we know, but what we do about it.

Now we haven't all the answers on static, but we have some of the answers on fire control, and if I might mention the company that I represent, we have over forty plants, representing over $200,000,000 insured value and probably another $100,000,000 of finished goods and goods in process, and we keep a very careful record of every fire and the loss of every fire.

We have a fire contest. I don't know whether you ever heard of a fire contest or not. I never did until I was told to start one, and I looked around and couldn't get much help, so all I did was took the severity and frequency of fires and we took the severity of fires compared with the insured value and the frequency of fires, and we multiplied the two rates and we got a quotient that we could use.

Alongside of that we put our loss ratio. Six years ago we had a fire loss, United States Rubber Company, including the Canadian plants, of which we have about eight, of something like $45,000 a year. The next year we cut that down to $40,000 and the next year to $35,000, and the next year to about $30,000, $35,000. Every year we reduce our fire losses. I went to the Factory Mutual whom we all admire and I asked our insurance carrier who happened to be the Arkwright, how our ratio compared with others, and I was very much pleased and surprised when he told me that we were below their average for our insured values. That pleased me and I knew that we couldn't continue that way, and sure enough last year, according to the old law of averages, we got a wallop and our fire losses last year were just double what they were the year before. But two of those fires were responsible for about half of our loss.

Now a strange thing did happen. During those fifteen years, fellows, we increased our fires a hundred per cent. Now I think one reason for the increase in fires was the increase in interest, in reporting fires. In other words, it's not what you know but what you do about it.

We went after the reporting of those fires, and we found out that many of them were static fires, so we did all that we could to stop our static fires. We even grounded our young ladies and humidity control. We still humidify as many other rubber manufacturers do. We grounded and we used the neutralizers and we are looking for the latest which I understand recently two or three new experts have come out with some new recommendations, and we have got to keep up to the times.

My advice for us all is to keep this question before us. I was on a static committee twenty years ago and they thought they had all the answers. They wanted to discontinue the committee. I said, "Oh, no," and that committee stayed in existence for many, many years.

Now we heard a little yesterday about the faults of management. We will always hear a few things about the faults of management, and it's probably healthy that we should. By the same token I think that it might also be stated, I know I cannot help but feel this, fellows, because I have been very close to the rubber industry for many years, and the one thing that has surprised me personally is what rubber manufacturers have done in the last five years in management.

Now when the war broke out we were forced into munitions. We were forced into many operations that we had never been in before, and I've been extremely pleased and I think you'll agree with me, with the way big management took that responsibility. They went into fields of activity that they had never been in before.

In my company, what do we know about explosives? And yet we ran eight munition plants. We made millions of pounds of TNT, millions of rounds of thirty and fifty caliber ammunition, loaded millions of forty millimeter shells, and fellows, during the whole period of the World War we did not lose one life due to a fire or an explosion in any of our munitions plants. As a matter of fact that goes for all of our plants. Not one life was lost due to a fire or explosion. That wasn't the fault of any one man; that wasn't wholly the fault of management. It was the fault of everybody working together, everybody cooperating, everybody realizing what their job was, that they had one big job and it had to be done and it had to be done safely, and it was done safely.

Now my experience in the United States Rubber Company is probably no different than the experience of other companies, but I just want our labor boys to get that picture. Static is one big problem, but we can't spend all our time on static. We can't spend all our time on labor.

We've got to turn out some production, and it's got to be quality production at a price, and we can do it if we all work together, just as we did during the World War.

We all worked together and we did one whale of a job, and it gives me a great deal of pleasure to come here and just get your thinking because I think a lot of the rubber industry in the State of Ohio. I try not to miss your Congress, I just came from a New York Congress last week. There were over eight thousand people down in Pennsylvania Hotel in New York last week, with a four-day conference.

They had a splendid session and it pleases me to feel that no time is being lost, no ground is being lost on accident prevention, and it's fellows like you that we rely on because no one person can carry the ball, it's a game where we have all got to work together and I feel that that same sentiment is being expressed at all of your sessions here in Ohio, as it is expressed in so many other sessions.

We don't want to talk penalties. I just read this book, the first time I've seen where you want to charge these fellows if they don't put on their gas masks. Well, gentlemen, if we had started doing that we'd have been rich today; but the thing to get them to do is realize why they are doing it. They're the ones that are going to pay the price.

Our biggest job is selling. We can bring our Professors in to do our engineering job, and we can go to work and put in our machines, and our guards and in spite of it all, it just happened only last week, in one of our plants, a boy eager to do a piece of work, jumped up on a conveyor nine feet from the floor and without any chance of holding, he falls over and he landed on his head, was unconscious, taken to the hospital, and the poor fellow died.

He was mentally disturbed when he did it because his wife was in the hospital with their first baby. Now imagine a condition like that. Is that management's fault? Is it the man's fault? The union's fault? I think we've all got a part to play, every one of us. The man should have been carefully supervised but when did it happen? Four o'clock on a Sunday morning. Because that's when the work was being done and the fellow was mentally disturbed.

Now is it management's responsibility to know the mental condition of those men and if a man is mentally disturbed we shouldn't ask him to jeopardize his interests, but you know how eager men are to do a production job. They don't think of themselves. They'll jump in there in order to get the conveyor going, and so let us assume the responsibility that we are our brother's keeper, that we have an interest in him and he has an interest in us, so that when we see a man jeopardizing his own interests, that we just tap him on the shoulder and just say, "Buddy, look out, you're going to fall."

I know I would like to get closer to our men. Whenever I get into a plant I always take advantage of talking at the men, talking to the foreman and talking to the workmen because I know they feel, "Well, here's a chap from New York, he's got all the answers."

I haven't got all the answers but I have got a few thoughts that I can give them so that they can for a few hours longer probably practice their production a little safer. So that is our job, fellows, and I know that each and every one of you are doing it. I thank you. (Applause.)

Chairman Berkey: Mr. Walter Schneider as I told you yesterday, could not be here because he was in another very important meeting. He is here today and I doubt whether Walter misses very many of these sections, and I think possibly he might have something to say at this time.

Mr. Walter Schneider: Mr. Berkey and Ladies and Gentlemen: I'm very happy to be here today. I enjoy these Congresses and I like to reminisce with Ernie Beck. Ernie is a favorite of mine and I don't mind telling him so; he knows it.

I think he has the proper aspect on this whole problem, and I think if we all used that method of approach in our attempt to solve this problem, we would be much further than we are today.

Chairman Berkey: Now there is another man here who has done a lot towards arranging for the rooms, the space, the tables, the blackboards and what have you. He's present in the room right now. I'd like to ask Mr. W. E. Perrine, Safety Advisor for Ashland, Wayne, Medina, Cuyahoga, Portage and Summit Counties, if he has something to say?

Mr. Wilbur Perrine: Gentlemen, Ladies. It's a pleasure to be here and arrange the rooms for you to meet, and it's very gratifying to see the advantage that is being taken by all of you because our attendance is much greater than it was two years ago.

I'm not going to say very much more, only that as Mr. Berkey stated, the counties which I represent for the Industrial Commission of Ohio, the Division of Safety and Hygiene, I'm at your service at any time you call on me. I'll be glad to come and see you help you in any way I can with your safety.

I have been working with the rubber concerns lately and I've had very wonderful cooperation of the concerns which I have gone through.

I expect in the very near future to visit the rest of them in my territory, and I know that they're going to give me cooperation. I'll be glad to help them in any way I can.

Chairman Berkey: I take this opportunity to thank the speakers that gave us these wonderful talks, the Program Committee who helped to outline and make this program possible, and members of the Department of Safety and Hygiene. I can't name them all: Mr. Sain, Mr. Fluker, and many others.

It has been a real pleasure to act as your Chairman and I know that I have gotten more out of this than possibly most of you have, but I think we all have gotten a great deal of good from these sessions.

I feel that they have been extremely interesting, and I feel that everyone who has attended these sessions will go home with something that he can use. If we get nothing more than an inspiration to do more, we will have spent our time well in these two sessions.

Chairman Berkey: The luncheon is in the Hall of Mirrors at 12:30. Mr. Jack Kidney is the toastmaster.

OCCUPATIONAL DISEASE HAZARDS — THEIR CAUSE AND CONTROL SECTION

Thursday Morning Session, April 18, 1946

This session of Occupational Disease Hazards—Their Causes and Control of the All o Safety Congress was called to order at 9:30 o'clock by Dr. A. L. Kefauver, Assistant ervisor, Medical Section, Industrial Commission of Ohio.

Chairman Kefauver: Well, gentlemen, we will open our session on Occupational eases, Their Hazards, Cause and Control. Occupational diseases have existed ever ce the time that man first began to work and as civilization became very complex hazards and the incidents of these diseases as a result of their work became greater, til now we are confronted with the greatest array and variety of conditions mankind s ever experienced in his coming up from early civilization. Nothing was ever done ch about occupational diseases until the near past. It was an accepted thing, and s considered as being inevitable. Every painter was supposed to have his bout with inter's colic and every miner, or certain percentage of miners, was supposed to have ners' asthma. Then there were some pioneers who started out and thought something uld be done about this thing; that it wasn't necessary to have these things. They re alone in their field when they first started, and they were really pioneers, but ey were persevering and much progress was made until now their efforts are just ginning to be felt.

New materials are being found from day to day and developed and are being used in dustry, but even new materials often bring along new hazards to the individual work- g with them. Many materials were developed during the war which we are going to e in the postwar period in industry, and that is a new challenge to the industrial hy- enist to see what if any effect these materials are going to have on the individual. It's is problem of postwar industrial hygiene that our first speaker is going to talk to us out today. Mr. F. S. Mallette has been associated with the Firestone Tire & Rubber ompany for the past four years in charge of the industrial hygiene activities. He came Akron from the Mellon Institute of Pittsburgh. Before that he did private consul- ation work in industrial hygiene. While at Firestone he pioneered in research on the ealth hazards of synthetic rubber materials as they were used in the manufacture of ynthetic rubber. Until recently he was staff representative of the Medical Section of he National Safety Council. He did graduate work at the University of Michigan, ittsburgh and Chicago. At the present time he is associated in special research pro- ress in Industrial Toxicology at Ohio State University.

It gives me great pleasure to introduce to you Mr. F. S. Mallette, who will now speak n "Highlights of Postwar Industrial Hygiene." Mr. Mallette.

HIGHLIGHTS OF POSTWAR INDUSTRIAL HYGIENE

Mr. F. S. Mallette,

Industrial Hygienist and Toxicologist,

The Firestone Tire & Rubber Company,

Akron, Ohio

Well, since the war ended there have been changes brought about in industry which affect all of us in industrial hygiene. For instance, during the war there was a tremendous pressure for production—production was primary; everything else was secondary. Contracts were let by the Government, the Army and Navy, and companies just killed themselves to put out the first unit for that contract, and in that process, as I say, everything else was disregarded, and one of the things which caused a great deal of trouble was the disregard for the presence of the industrial health hazards. Many companies went into the development of products of which they had no experience at all. They had little knowledge of the technical aspects of the product, to say nothing of the presence of any health hazards that might be associated with it.

For instance, I know of an aviation company which landed very lucrative contracts for the production of barrage balloons, and it looked like a simple process. All you did was to cut up rubberized fabrics and affix the seams with rubber cement, just like doing dressmaking. Oh, it was easy to teach girls to do, and they turned them out at a very rapid rate, but unfortunately the cement they were using contained benzol. They never had any experience with it; they never thought anything might occur, and soon the girls began to feel weak, show signs of anemia, nausea, effects from using the cement containing benzol. This company had to stop production and install ventilation control methods and methods to keep track of the people's health while they were working with these materials, and in the long run, of course, they had lost ground because they had lost time in halting production while they caught up with some knowledge on the facts they should have had before they started the work. There should now be some ease in the face of that. Of course now we are changed over to reconversion, but let us learn the lesson we did during the war, not rush into things too hastily. Let's study the process which our companies are going into in the reconversion program. Much can be done if the plans and operations are studied ahead of time so that the presence of industrial health hazards and industrial injury hazards are foreseen and precautions taken against them.

Among the changes which the end of the war has brought about is the change in the type of personnel. We all know how the companies had to scrape the bottom of the barrel for people to fill their plants after the men had gone away to war, and, of course, there were many of the young, very young, many of the old, many who were poor in health and poor in mental equipment who had to be utilized, and exposing these people to industrial health hazards and poisons of course was an even greater danger than exposing people in the prime of health selected for their physical fitness so we should begin to perhaps get away from some of that.

In addition we should get away from the problems which arose as a result of the large number of women in industry. I don't need to elaborate on the problems which women brought in. There have been speakers at previous meetings here and it's a subject which was worked over again and again, and I am sure you are all familiar with the problems which women brought into industry. Well, now women are beginning to drift out of industry again and each time, after each war and after the influx of women into industry there are always a number of them who are retained but it isn't anything like the problem it was four or five years ago when I know I had thousands of women to think about and whose health I had to consider, and for me, I had to have special regard because of their susceptibility to the industrial health hazards.

With the change brought about by the end of the war there have come many new developments. First of all I am going to speak about the legal developments which have appeared since then and first of all I want to say a little about the Ohio Industrial Health Code which was recently adopted by the Public Health Council and which will become effective January 1, 1947. This code has been discussed twice already at these meetings by engineer Joseph Flanagan, of the Division of Industrial Hygiene of the Health Department, but I do want to say a word in passing; if you haven't already seen the Code or heard about it, I suggest you get copies from the Health Department and study it, because there probably is no industry in Ohio which won't be affected by it in some manner or other. The standards which the Code contains are those which are accepted by authorities in the field and I urge your cooperation and support for the able people in whose hands the administration of this Code lies.

Another development in the same field is the proposed revision of the safety codes of specific requirements of the Ohio Industrial Commission which were petitioned for by several labor organizations but in particular by the steel workers and rubber workers' union. A hearing has already been held on this subject and the proposals have been taken into consideration. In general, the principles of the proposed rubber workers' code, the only one with which I am familiar—I am not familiar with the steel workers' code—but in general the principles refer to the prevention of accidental injury, but there are a few which relate to industrial health and sanitation, and I am going to call your attention to them.

The first part of the proposed Code deal with the purpose and scope, definition of terms; part four, for instance, deals with safety requirements. Section 1 is on "floors." Section 2, "aisles, corridors, stairways." Part Five deals with "machinery" Section 1 with "Types of machinery", section 2, "Switches and other electrical apparatus", Section 3, "Mill roll height", Section 4, "Safety-trip controls and quick stop facilities", Section 5, "Safety-trip control calendars," Section 6, "Batch off conveyors", and Section 7, elevators."

Part 6 deals with the determination of distance of travel; that is for brakes on mills and calenders. Part 7 deals with "Devices for protection", Section 1 of that with

hards", and then in Section 2 we begin to get into some of the parts which interest us industrial health. Section 2 deals with "Clothing, respirators and goggles." All suitable means shall be used to eliminate conditions of exposure that might cause eye injury. Eye shields or suitable safety goggles shall be provided by the employer that there is any danger of eye injury from emery, flying chips, hot scale, hot liquid, burns or flashes. Employers shall furnish employees engaged in air or sand blasting with respirators, hoods or helments adapted to the work to be done. This safety equipment shall bear the approval of the U. S. Bureau of Mines.

"The paramount duty of every employer to maintain the air of all work rooms and work places in a safe and healthy condition at all times is hereby recognized and affirmed. In operation in which this is not possible, suitable respiratory protective equipment shall be provided for all employees exposed thereto and it shall be worn by them. Such equipment shall bear the approval of the U. S. Bureau of Mines."

While this is the rubber workers' proposed revision I am sure that all other industries, the steel workers and foundry workers and so on will contain similar provisions for operations in which this is not possible; that is where it can be kept in a safe and healthy condition.

"Suitable gloves, boots, aprons and goggles and other protective clothing shall be furnished by the employer and worn by the employees engaged in the use of sulphuric, muriatic or other acids, or solvents, or pigments which may be injurious to the employee." The word "pigments" in the rubber industry refers to materials in general that are used in compounding rubber.

Part 8 deals with the subject of Ventilation. Section 1, "Where smoke, steam, fumes, gases or dusts arising from any of the operations in a rubber shop may be injurious to the health or safety of the employees, there shall be installed and operated proper hoods, fans or other means of ventilation of sufficient capacity to remove such smoke, steam, fumes, gases or dust.

"Employees whose work exposes them or may expose them to substances of such hazardous nature that a close watch on their condition is advisable may be given regular or occasional physical examination as a check on the adequacy of the preventative measures used, provided, however, that the findings of each such examination shall be available at all times for examination by a physician of the employee's choosing and any employee so examined may have a check examination made by a physician of his choice.

"All mixmills, banbury mixers, warm-up mills, tube machines, tubers and calenders shall be equipped with proper and sufficient ventilation.

"All spreader machines, dip units, and ironers, shall be equipped with proper and sufficient ventilation to safely remove all fumes and gases.

"All cement mixers used in the mixing of solvents and the department in which they are located shall be properly ventilated so as to remove all fumes and gases emitting therefrom.

"All spreader machines, calendars, dip units, or cement mixers shall have proper static control, humidification and fire equipment installed and operated.

"Where smoke, fumes, gases, or dust arising from any of the operations in a rubber shop may be injurious to the health of the employees, measurements shall be made by a competent ventilating engineer designated by the employers for that purpose, and all such measurements of air conditioning shall have the approval of the Ohio Industrial Commission. This shall apply also to installation and type of equipment used.

Part 9, "Maintenance and Inspection. A daily visual inspection of all machine units in which solvents or gases are used shall be made by a competent employee designated by the employ to do so. Such inspection shall cover static control, humidification, fire protection and ventilation.

"Chains, cables, tramrails, trolleys, straps, ropes, slings, electric hoists, spreader hooks, steel bars, and safeties shall, prior to their use, be inspected daily as to their safety by the men preparing and using the same, and in addition, a regular inspection as to their safety shall be made once a week by an employee designated by the employer for that purpose.

This goes on with further inspection of machines and equipment.

Part 10, "Heating and Lighting. Where light is insufficient to properly light the rubber shop, artificial light of sufficient power shall be provided. All aisleways, corridors, passageways and stairways shall be properly lighted at all times.

"Where light is insufficient to properly light the area in which work is performed, artificial light of sufficient power shall be provided.

"A minimum temperature of 65 degrees Fahrenheit shall be provided and maintained at all times in any section of shop where employers are required to be at work." Now I don't think they thought that through very carefully, because obviously if it's

95 outside you have to go some to produce a temperature of 65 inside, and invariably—anyway, the change would be tremendous. 65 in the Winter time is just about sufficient. They probably will work over that section.

Section 11, "Sanitation and comfort. Suitable facilities shall be provided employees for drying their clothing when necessary; such facilities shall be located in the washroom., locker room or in a room used exclusively for that purpose.

"Inside sanitary water closets shall be provided in every rubber shop and for each sex according to the following table:—" They give a table providing for the number of water closets which I believe follows the public health service code fairly closely. For instance, for one to eight persons you provide one and from 68 to 138, six. The ratios run one for eight, one for ten one for eleven, one for seventeen, and one for twenty-three.

"For every unit of 62 or fractional part thereof in excess of 138 persons employed, two additional water closets shall be provided . Most modern plants provide better facilities than this calls for.

"All toilet facilities shall be completely separate from locker and washrooms.

"All water closets and toilet seats shall be properly sterilized regularly one each shift

"In every rubber shop there shall be provided one urinal. Where more than 32 or less than 80 males are employed, two urinals shall be provided and thereafter one additional urinal shall be provided for every 80 males employed or fractional part thereof. At least five linear of trough or slab urinals shall be considered equivalent of one urinal.

"Wash basins with an adequate supply of hot and cold water shall be supplied according to the following table—" There again I believe it follows the Public Health Service Code. For instance, from 46 to 65 persons you provide five wash basins. That is a ratio of one for 13.

"For each additional 25 employees at least one additional wash basin shall be provided. Twenty linear inches of sink shall be considered equivalent of one wash basin.

"Soap and paper towels shall be supplied wherever there is a wash basin.

"Washrooms where 16 to 35 men are employed, shall be provided with at least three shower baths with an ample supply of hot and cold water, and for every additional 35 men, three additional shower baths shall be provided. Where men are employed in shifts the same ratio of shower baths shall be provided for each shift of employees.

"Employees in a rubber shop who come in contact with pigments, acids, lead or solvents shall be supplied with soap and turkish towels for shower baths.

"Individual type lockers ae least six feet in height and 12 by 18 inches inside measurements, with hinged doors arranged for locking, shall be provided for employes and shall be placed in a room adjoining the opening into the washroom.

"All aisleways between the lockers shall be at least five feet wide between the rows of lockers, and shall be maintained at this distance at all times.

"Employees working with pigments, acids, lead or solvents shall have one locker for dirty clothes and one clean clothes.

"All washrooms and locker rooms shall be well lighted and ventilated and kept in a clean, sanitary condition at all times, and when in use shall be maintained at a temperature of not less than 70 degrees Fahrenheit.

"All washrooms and locker rooms shall have adequate mirrors for the use of the employees.

"All shower and washrooms shall be supplied with adequate hot and cold water.

"Sanitary drinking fountains shall be provided throughout the rubber shop by the employer.

"The general sanitary rule of the Industrial Commission of Ohio shall apply in all matters not specifically covered in this section

Part 12 deals with the subject of First Aid. "The following provisions shall be made for First Aid, to be used in case of injury until a regular physician takes charge:

"In every rubber shop there shall be a First Aid dispensary, fully equipped with first aid supplies that shall meet the first aid requirements of the Ohio Industrial Commission

"All such dispensaries shall be replenished, following an accident, according to the requirements of the Division of Safety and Hygiene of the Ohio Industrial Commission

"All rubber shops shall have some competent person trained in first aid to work on all shifts for the purpose of administering first aid in case of accident, and they shall be acquainted with dispensary first aid supplies, and also provided with a list showing the names and telephone numbers of competent physicians, hospitals and ambulance in case of serious accident.

"The above mentioned provisions will not be required where a plant hospital dressing room or dispensary with supplies in excess of the above is maintained and where a competently trained person is regularly employed to supervise such plant hospital"

Now, for those who came in after I began to read this, this is a proposed revision which has been submitted to the Ohio Industrial Commission by the rubber workers' union and a meeting was held to consider it and it is now being considered and probably further hearings will be held.

Well, that pretty well covers the legal developments, at least in the state of Ohio. Of course there have been developments outside of Ohio. For instance, other states have passed Occupational Disease Compensation Laws and I think there was one of the last few states that didn't have it passed a workman's compensation law, but of most interest to those in the protection of the workers' health were the technical developments which came out of the war, and like any other ill wind, the war blew some good.

One of the most interesting and striking developments came out of the development of the atom bomb. I don't suppose there is a meeting being held anywhere today which doesn't somehow or other get around to the atom bomb, and we are no different here, but before the development of the atom bomb—these things are beginning to leak out. There hasn't been any too much provided in the way of information yet. Of course, they knew there were dangerous radiations which would be present and for which protection must be provided. Probably there were no new types of radiation but there were compounds of neutrons for which control measures had to be provided. Now, if the promised development of atomic power, nuclear energy ever reaches a peace-time degree of development so that it can be used in industry, we may have to be faced with this very sort of thing, so we can profit by the things which they learned in the atomic bomb project. Well, in general, they found that if they built their buildings a little thicker that it took pretty good care of these increased and intensified radiations. They found that thicker concrete walls provided excellent protection. However, they had to train all of their personnel to recognize and understand these hazards to which they were exposed and to take advantage of the information which was developed to protect them against it. They also developed many new and extremely accurate instruments to detect these radiations and so far there has been very little divulged as to their character, but we can surmise that they probably operate on principles which were known before the atomic bomb was developed. In addition they had to develop methods of monitoring; that is detecting on a continuous basis the amount of radiation to which each of the workers was exposed, and there has been a little data coming out on that, but they used many of the methods which had previously been used in protection against X-ray. For instance, the badges which the workers wore for identification contains a small piece of photographic film and those were collected periodically and developed, and the amount of effect upon the film was measured and in that way they could tell just what his state of health might be, but that is probably pretty far in the future and it is more of interest in a sense of speculation than it is the fact that it will come up tomorrow and we will have to contend with the hazards of nuclear energy, but among the other tools which were greatly used and accelerated during the war period were those of the pneumatic type, and I think the one which is pehaps most important to all of us is the riviter.

Many years ago Dr. Louis Hamilton described the effects produced by the vibration of the jackhammer—I think it was 20 years ago or more, but today these few tools with their extremely high frequencies of vibration are producing these effects much more rapidly and to a much more marked degree. I don't have time to discuss, nor am I competent to, the pathology of the injuries produced. If you are interested in this I suggest that you read the original papers by Dr. Cralen and Dr. Dart which were presented at the meeting in Chicago last week of the American Association of Industrial Physicians and Surgeons. However, I did gather this much, and incidentally, much of the material which I described here was given in the papers which were given last week. I had quite a time because it was an enormous meeting. There were many papers, and they used split sessions, and I ran back and forth trying to cover both of them. I had quite a time, but I missed out on some of them, but so far as the effects of these highly vibrating tools are concerned, a paper was presented by the workers there and again at the meeting in Chicago last week in which they advocated the change in that procedure so that particles above five microns would be more or less disregarded so far as the counting of test samples was concerned. In addition, in studying this matter they found that the percentage of free silica in the particles of dust above five microns—well, that was quite a serious matter because it might alter somewhat the action of those tests. It was found to be especially true of tests collected in potteries, foundries and glass plants and some others. For these reasons these workers believe that particles larger than five microns in size should be eliminated from consideration both in the

counting and in the determination of the percentage of free silica in making test samples. and, incidentally, the new Ohio Health Code advocated the same proposals.

There were many instruments developed during the war coming out of various needs of the armed forces and one of them was a new and extremely accurate and sturdy carbon monoxide detector. It was developed for use in aircraft so it had to be able to stand very hard punishment and yet be extremely accurate. Well, now, we can begin to take these things over and employ them in peace-time industry. This particular instrument provides both a visual and auditory signal when the permissible limits of carbon monoxide is exceeded. This will find us, for instance, in the production of inert gas for atmosphere over explosive liquids and for the annealing of stainless steel and nickle and other metal units of a sensitive character May be used, for instance, in solvent recovery systems, reducing economic loss and danger to personnel.

A portable apparatus for the determination of methylchloride was developed for use in the synthetic rubber industry. With refinements this can become useful in the determination of other chlorinated hydrocarbons.

A conspicious oxygen indicator has been developed for use in process control. It is extremely accurate to one hundredth of one per cent. Further development of this instrument may result in the production of a portable oxygen deficiency indicator. At the present time it can only be used in fixed locations because the temperature has quite a marked effect on the detecting cell.

Among the other papers presented at the meeting in Chicago was one by Leslie Silverman, of Harvard, who reported extremely interesting findings on respiratory air flow characteristics and their relation to certain lung diseases. A study of records obtained by new instruments developed for recording instantaneous air flow during inspiration and expiration displays value in diagnosing asthma, emphysema and silicosis. Of particular interest is the fact that the method appears to be of value in differentiating between lung depositions which produce fibrosis, such as silica, and those which accentuate the X-ray appearance, such as iron fumes, but do not produce disabling fibrosis. Much attention has recently been paid to the occurrence of this pseudo-fibrosis in welders. So this new method may be of great value because X-ray pictures of workers who have been exposed to large quantities of iron fumes are extremely difficult to differentiate between that condition and one of true silicosis.

Well, the last paper that I heard at the meeting—unfortunately, I missed the first part of it—was the most interesting on the program. Dr. Machle who used to be down here in Cincinnati at the Kettering Laboratory discussed the physiology of work. I don't think I realized until I heard him how little we did on that subject. The Germans did quite a lot. They even had a journal on nothing but that subject. We haven't reached that point yet. Dr Machle pointed out, for instance, that of necessity, probably, much of industrial equipment and machinery is standardized. No consideration, for instance, is given to the characteristic of the workers who will run the machines. They don't know anything about his height, weight, length of his arms or anything else, and yet that is an extremely important feature and should be studied. He feels that a great deal can be done to transfer the burden of work from man to machine, for instance, by the use of boosters which showed a marked reduction of oxygen consumption by the worker, resulting in better performance and reduction in energy output was true in these cases. He mentioned in particular the study of the adaption of gyro-stability in tanks. They did a lot of work on tanks during the war down at Fort Knox. Dr. Machle was active in that work and it was desired to apply the principle of gyro-stabilization to the tanks so that firing could be done while the tank was in motion. Prior to that time the tank had to come to a stop, the gun aimed and then fired. A lot of time was lost. They wanted to develop the tank in such a way so it could be used to fire while in movement so they were gyro-stabilized. Unfortunately, in spite of this excellent mechanical equipment, the man was left entirely out of the picture, the factor of the reaction time, that is the time between when the man decides to make the move and when he does it, wasn't considered at all, so the first tanks developed along that line weren't very satisfactory because they resulted in a large number of misses, so they had to go back and start over again and consider the average reaction time of the soldier firing the gun and then they were more successful.

Well, this field of industrial physiology holds a great promise and we can look forward perhaps for great findings in the future.

Chairman Kefauver: I am sure that we are all thankful to Mr. Mallette for bringing us his message and especially the new work that is right up to the minute that he heard about at the Chicago meeting.

Does anyone have any questions they would like to ask? I was wondering when you

are speaking of silicosis, was the question of the aluminum test treatment brought up at the meeting?

Mr. Mallette: Yes. There was a paper given on it, I think, by Dr. Rudan, who did some fine work on it, but he didn't explain about it. Practically every morning you go to now you hear something about aluminum. I tried to choose some things which I felt might not be talked about, and perhaps you would not have heard before but there was a paper on aluminum there.

Chairman Kefauver: But there has been no change in opinion, still a disputed thing, I suppose?

Mr. Mallette: That is right. Of course they are gathering a great deal of evidence. I think the consensus of opinion so far as the aluminum test is concerned, as I hear it at the various meetings about the country, it's an extremely useful agent in the prevention of silicosis but it's very questionable whether it has any effect in the therapy, the cure or even in the relief of it's symptoms.

Dr. Shafer, Medical Director, Frigidaire Division, General Motors Corporation, Dayton, Ohio: I listened to both papers at the meeting, the one on experiments with animals and the one in the treatment of silicosis. Comparing the two sets of animals over the short period of time, the paper given on the treatment of silicosis by the dusting method, and the opinion there based mostly on the quantitive experience is that it has kept those workmen that have definite silicosis from going too far in advance and being disabled at a more early period, but it hasn't cured the silicosis. The disability has been the same in those cases wherever infection is present, but you still have your same old picture. There is no relief from dusting as indicated, but the dusting is given and they give the method of giving it. They showed the apparatus and the frequency.

A woman from Pennsylvania has done a lot of work in the coal mines and the smoky industries in Pennsylvania and wrote a paper which is well worth reading.

Chairman Kefauver: I think we have another question.

Dr. .... (Barberton, Ohio): I would like to know if there is any hazard of neoprene on the skin.

Mr. Mallette: Well, that is very interesting because I had to check up recently on it so far as neoprene itself—I am speaking of the crude stock—is concerned, there are probably no hazards at all possibly an occasional case of dermatitis occurs, but I feel that that is more due to the presence of other chemicals in the stock, for instance, antioxigen and so forth than it is the neoprene itself. Back in the middle thirties a great deal of close study was made on neoprene by the DuPont people. It was duprene at that time, if you recall, but it is essentially the same thing. However, the material from which neoprene is made is an extremely toxic material and I think perhaps sometimes there is some confusion because of that fact. Chloroprene is extremely toxic, but after it has been processed and especially when the stock has been cured, there is no toxicity present. There may be occasionally a case of dermatitis, but that is more due to other chemicals in the stock.

Dr. . .. .. : We have a type of spray.

Mr. Mallette: That is a different thing. I thought you referred to cured neoprene stock. Now, neoprene latex, of course, is a liquid and there are stock materials in it—the DuPont people informed me that they have been striving to lower the percentage of chloroprene in their latex. It has contained in the past something as high as four or five per cent. There is a possibility some one may absorb enough chloroprene so as to be hazardous. However, it is extremely irritating to the skin and practically every company which has used neoprene latex has had some difficulty with dermatitis. It is extremely irritating but their method of control to prevent the contact with the skin should be utilized. That is where the cardinal principle lies. You can't do much probably, to change the latex although the DuPont people are trying to get the chloroprene content down, but everywhere it is used there is quite a high incidence of dermatitis, but if you can—I don't know how—you say, "Spray"?

Dr. ----------: Yes.

Mr. Mallette: Well, if you can of course provide local exhaust ventilation if you can't protect the worker by means of sleeves and gloves, aprons. Protective garments are of value, and encourage them to use them frequently and to get it off his skin before it takes effect. Has it been dermatitis which has occurred?

Dr. .. ...: Dermatitis has shown up.

Mr. Mallette: I believe that is probably all it will do, although I am planning some studies right now on the amount of chloroprene in the air where neoprene is used because this question has come up.

Dr. W. E. Obetz, Medical adviser of Safety & Hygiene: How about rubber gloves out of neoprene?

Mr. Mallette: Well, there has been quite a lot of dermatitis, Dr. Obetz, but I think it is due in most cases to the antitoxigen. We have been doing a lot of testing on young people who were affected by neoprene gloves. We purchased several hundred pairs and put them in our steel products department and we got a flood of dermatitis all of a sudden. We tested many people and we found that the gloves plus the caustics and things; we found the compounding ingredients in the gloves and came down to the antitoxigen. Where it was put into the synthetic rubber, of course, it occurred in products which were made from the synthetic rubber itself.

Dr. Obetz: Does that apply to both kinds?

Mr. Mallette: Both the neoprene and the buna.

Dr. Obetz: The same antitoxin was not used but it produced the same effect?

Mr. Mallette: Yes.

Chairman Kefauver: Our next speaker needs no introduction. Dr. M. M. Shafer, Medical Director, Frigidaire Division, General Motors Corporation, Dayton, Ohio.

PERSONAL PROTECTIVE EQUIPMENT AND HOW TO USE IT

Dr. M. M. Shafer, Medical Director,

Frigidaire Division, General Motors Corporation,

Dayton, Ohio

Mr. Chairman, members of the Sixteenth All Ohio safety Congress: It's a pleasure to be here today. The subject that Dr. Obetz assigned to me is one that I think we are all more or less familiar with, and I hope our previous speaker, Mr. Mallette, will pardon me if I refer to this paper in several connections, because it was a very interesting paper and it touches, in several instances on the personal protective equipment that I am going to talk to you about.

It is obvious from the outset that such a vast subject could not be covered in detail in such a short time. Therefore I am taking the liberty of listing some of the personal protective equipment with which I am familiar and will attempt to discuss the proper use of some of these which have caused the greatest difficulty.

The following list, starting from the top of the head and going down to the feet, represents a part of the personal protective equipment in everyday use in a great many plants. It is obvious from the following list that no discussion is necessary in order to use some of this equipment correctly and properly. In my own company all personal protective equipment is furnished the employe free of charge.

I. Head Protection
   - A. Steel hats
   - B. Guardi-Ann or other type head protection for women

II. Goggles
   - A. Various Types
     - a. Welders (shade of lens)
     - b. Acid free
     - c. Shatter proof
     - d. Shatter proof with side shields
     - e. Rx shatter proof
     - f. More goggles (several types)

III. Face Shield
   - A. Welders
   - B. Plastic shields

IV. Ear diaphgrams

V. Respirators
   A. Various Types
      a. Dust
      b. Fumes
      c. Gases
      d. Acids
      e. Alkalis

VI. Salt tablets

VII. Protective Creams

VIII. Positive Pressure Air Hoods
   A. Porcelain
   B. Sand blast

IX. Coveralls—slacks—smock or dresses

X. Aprons
   A. Rubber
   B. Leather
   C. Cloth
   D. Plastic
   E. Oiled silk

XI. Sleevelets
   A. Waterproof
      a. Rubber
      b. Plastic
   B. Leather
   C. Chamois
   D. Leather with rivets
   E. Asbestos

XII. Gloves
   A. Rubber
   B. Synthetic Rubber
   C. Canvas
   D. Leather palm
   E. Chrome leather
   F. Asbestos
   G. Heavy leather with staples

XIII. Leggings

XIV. Spats

XV. Shoes or Boots
   A. Steel toes—safety
   B. Steel toe guards
   C. Rubber boots
   D. Wooden soled mop shoes

XVI. Electricians Chrome Leather Hood and Coat

XVII. Asbestos clothing

XVIII. Acid proof suits

XIX. Safety belts

In our plant we have very little use of steel hats, however, we have considerable use for the Guardi-Ann safety caps for women that are working on revolving machinery. In passing, I would like to leave with you this one thought "that no matter what type of safety cap you choose for your women employes to wear, it will never satisfy them all". So, the best that you can do is secure a type of safety cap that does the work and insist upon its being worn when the operator is working on revolving machinery.

Goggles are one of the most important safety items used in protecting our employes. No one has, as yet, designed an all purpose safety goggle. In some areas it will be essential that the goggles be equipped with side shields, in others the plain goggles without side shields will give adequate protection. In other places the cup type goggles will be preferable. There will be hundreds of complaints as to why they cannot wear goggles on this or that particular operation and some of these complaints will be justified. During the war we had occasion to equip some eight thousand of our em-

ployes with safety goggles and I feel I can speak with some experience as to how best to cope with the goggle situation.

First—it is essential that the goggles be of the proper type to give adequate protection for the job on which it is to be used.

Second—the goggles must be properly adjusted and fitted.

Third—this adjustment can only be done by someone thoroughly trained in the proper fitting and adjusting of goggles.

Fourth—goggles must be kept clean and when the lenses become pitted so that they hinder the vision of the employe, the lenses should be changed.

Fifth—once the above essentials have been met and the employe is still complaining about the wearing of the goggles he has either some eye difficulty for which prescription goggles must be ordered or he is just trying to get out of wearing the eye protection. We always think the former is correct and advise the employ to have an eye examination by an optometrist or preferably an oculist and a prescription secured. We then have the proper RX prescription lenses ground and placed in this employe's goggles. These are then checked by our goggle service man and the optician or oculist. By following the above simple procedure we have eliminated 99% of goggle complaints of any serious nature. The other 1% no one can satisfy and a job change or elimination is necessary.

Mono goggles can be worn over personal prescription glasses until proper RX safety lenses can be secured and employes needing prescription goggles can work on hazardous jobs with this type eye protection.

Obviously welders goggles are not covered under the above discussion and these special type goggles should be provided in the proper shade of lenses for the welding job that is to be done.

Protective face shields are some times used to protect the individual from flying particles and this material is satisfactory providing the flying particles are small and insignificant. However, our experience with protective shields was quite unsatisfactory as they were discarded almost entirely due to the fact that they were being used to protect against flying particles or the possibility of broken wheels or grinding discs which flew with such force that the protective shield did not protect from severe injury to the face or the danger of breaking personal glasses which were often worn under them.

Wherever possible, hazardous areas, in which eye protection is essential, should be set aside and plainly marked as "Goggle Areas" and no one should be permitted to enter without adequate and proper eye protection.

Ear plugs or rubber diaphrams are used in areas in which the noise is distressing and aggravating to the employe and which over a long period of exposure (such as the case of boiler makers) is likely to cause deafness.

Respirators—positive pressure air hoods, types used for dusts, fumes, gases, acids and alkalis.

One of the most hazardous of all occupations in industry is sand blasting in which the inhalation of fine particles of silica dust over long periods of time without adequate protection will cause the dread disease known as silicosis for which there is no known medical care. The Mine Safety Appliance has developed a sand blast hood with positive pressure air lines which if worn constantly while exposed to the silica blast operator. Instead of breathing the contaminated air in the area, he is supplied with purified compressed air at the rate of about six cubic feet per minute through a special air line connected directly with his mask. However, at times I have noted in sand blast operations that the operator wears the positive pressure air hood during the entire time that the sand blast is going on but that when the work is being changed and the area still quite contaminated with the fine silica particles floating in the air that the hood is removed and no protection is worn. I feel that it is essential that a Dust Fee or Wilson type respirator be worn while the work is being changed on the sand blast table. In order to avoid this exposure to silica dust, it is being recommended in all departments wherever possible that shot blasting should be substituted for sand blasting to avoid any possibility of exposure to large amounts of silica dust.

A very light type of positive pressure air mask is made by the Mine Safety Appliance which can be used on various dusty jobs or exposure to various fumes, mists, gases, etc. where adequate exhaust ventilation is impossible. This positive pressure air hood operates on exactly the same principle as the heavier sand blast hood but is made of impervious lighter materials and is not uncomfortable to wear. However, the air furnished to the operator is compressed air which has previously been purified of any contamination before being supplied to the mask. This mask is particularly applicable to such jobs as porcelain spray, paint spray, cleaning of acid and alkali tanks and other jobs where the exposure is such as to be hazardous without having adequate air supply. Cleaning the inside of tanks has caused a great many deaths and a noble

pressure air hods supplied to the operator working inside the tank would not hinder the operation to any great extent but would give the workers purified air to breathe regardless of what the tank contains which is being cleaned. This mask is applicable to all hazardous occupation in which exposure is through the inhalation of dust, mists, fumes or gases.

There are many different types of masks in every day use which are applicable to the protection of the individual from the inhalation of various respiratory irritants and toxic agents. But it is essential that the right type of respirator be used on the particular operation for which it is designed and recommended. It would be as foolish to use a Martindale mask in the prevention of inhalation of chlorine or other highly irritating fumes as to use a pair of canvas gloves in a heat treatment operation. If the respirator is designed for a special usage it should be limited to that usage and not used for other purposes. On the cartridge type respirators the attached cartridge contains certain chemicals which are used particularly to filter out or neutralize the fumes to which the individual is being exposed at that particular time. Obviously again, if the wrong chemicals are in the cartridge and the exposure is to a type fume which they do not counteract, then the individual has little or no protection even though he is wearing a respirator.

Dr. Shafer: If there are any questions, I will try to answer them.

A Voice: What has been your experience with laminated goggles?

Dr. Shafer: Plastic.

A voice: Yes. They are laminated.

Dr. Shafer: Well, we haven't had any experience. We have used one Bausch & Lomb developed and there is a company in Dayton which develops a plastic goggle, but during the time of the war they had so much work they didn't do anything about it; that is the Univex Company. I imagine they will come out with their plastic molded goggle. I suppose it's all right. It was tested before and it gave adequate protection. There isn't any reason why it couldn't be used.

Mr. John N. Carr, The Lubridol Corporation, Wickliffe, Ohio: What experience have you had with complaints regarding the forging of various types of goggles where a man is doing hot work, for instance, and is required to wear a dust or fume resisting goggle?

Dr. Shafer: Well, you have that difficulty; there is no question about it. The solution isn't exactly clear. Some times the one that is made with the double lens in front with the water supply, they can brush it all down. It has given us the most successful use. You know the one I am talking about?

Mr. Carr: Yes.

Dr. Shafer: But you still have the same problem; the fog comes back again. There is no good anti-fog goggle I know about today.

Mr. Carr: I thought possibly you would say that these hoods would be good.

Dr. Shafer: The hood wouldn't give you much help.

Dr. Emery R. Hayhurst, Columbus, Ohio: Doctor, do you know any alarm signal or systems or concentrations that might occur of these toxic substances?

Dr. Shafer: Yes, we do have on sulphuric dioxide, Doctor. On the concentration of sulphuric dioxide it automatically sets off an alarm and opens the ventilators and it will start the exhaust fans only when there was a concentration developed, but that was the only one we had occasion for. With the newer gases used in refrigeration we don't have any hazardous exposure of that type.

A Voice: In the control of dermatitis did you try creams? You spoke about washing four to six times a day without applying creams. What type of subject did you use in your test?

Dr. Shafer: We tried every type of subject on the market and we finally ended up with one that is approved by the General Motors, a pulverized soap, one with cornmeal in it.

A Voice: Did you try the test without applying creams in controlling this dermatitis?

Dr. Shafer: No, we didn't.

A Voice: Just washing?

Dr. Shafer: I imagine it worked out just about as well, although applying cream does have some effect on the prevention of it getting into the pores, but in abrasive areas it will get through there frequently; there is no question about it. There is also involved the individual susceptibility to it in all dermatitis, because men have worked for years and years, side by side, doing the same work, handling the same compounds, and one fellow has the dermatitis and the other fellow who does exactly the same type of job, indentical in all respects, doesn't have it.

Mr. Robin Beach, Engineer, Brooklyn, New York: Was I just plain lucky on this or not? I did work on static electricity at Goodyear Tire and Rubber, and on my first at Akron I got dermatitis on my hands and arms and it went down to my legs and feet, and I just felt like a leper. When I went back to the city I went to some skin specialists, and of course you know the old saying about them—it's quite a racket— the patient never dies, and neither do they get well. (Laughter.)

I spent six or seven hundred dollars while in the city, and then I went back to Akron again. I was pretty disappointed, so finally I talked to a calender man. I said, "Do you ever get this sort of thing?" He said, "Oh, yes, about every six months I get a touch of it." I said, "What do you do?" He said, "I get a teacup full of lysol, pour it in a tub of water and crawl into it up to my neck, and that will clear it up." I went back to the hotel; I did it, and within a few days later I did it again, and a week later again, and I was completely over it. Does that sound reasonable to you? Is that something that is really a treatment?

Mr. Shafer: Well, I have heard a lot of similar things along that line in which they used a very simple remedy. How much Lysol did you use?

Mr. Beach: A little teacup full in a tub of water.

Dr. Shafer: That is a mild antiseptic. To say whether or not that did it, I don't know. The next individual may try it and he may be a little sensitive and the phenol might make it a little worse, so he would give you the dickens for it.

Mr. Carr: I had one more question. You may not be able to help me, but I thought possibly there was someone in the room who could. One of our divisions handles an acid which is a rather dangerous material from the standpoint of skin exposure, and a new plant manager brought us a formula called ferric chloride tincture. He tells me it was used during the war in the petroleum industry for first aid treatment of phenol burns. Everywhere I have asked in the Cleveland area they tell me that the first aid procedure is to use alcohol to wash off the phenol and then treat for burns, and he tells me that he has seen individuals pretty thoroughly sprayed with phenol given immediate attention with the ferric chloride solution and go back to work the same day, so I wondered whether anyone here ever had any experience with that particular kind of treatment?

Dr. Locksen, Columbus, Ohio: I can answer that question. I am practicing dermatologist. I can tell you ferric chloride will give a pigmentation of the skin to a fairly large number of persons and this will be permanent, so that if you apply ferric chloride on the face or on the hands it will show for years to come. That has been used in the treatment of poison ivy at times, and it isn't considered good therapy because of that fact. I think your alcohol treatment, that neutralization is your best treatment.