

experienced, have proved most successful. Posters from the National Safety Council are also extensively used.

However, bulletin boards may lose a great portion of their effectiveness, in spite of regular changes of materials. We felt that a new method should be tried, and the moving picture with sound reproductions was adopted. We now have four or five underground theatres, equipped with permanent benches, a ten foot screen, and electric lights. Notices of scheduled shows, which are held before the men start their shifts, are posted a day or two in advance, and as the men enter the mine they are greeted with music amplified from phonograph records placed on an ordinary turn-table equipped with an electric pick-up. Lively marches and popular pieces are played as the men gather at the theatre.

The first film is usually a comedy which makes for a feeling of good fellowship and creates in the group a responsive mood for the discussion of safety, health, or other similar subjects. To illustrate or clarify some accident, stereopticon slides are extensively used. Following the safety reel, a second comedy or educational film that might fit in is usually given. The entire program takes about 35 to 40 minutes. It has been noted that all employees, whether engaged in underground or surface work, make every effort to be present at these shows.

Through this method of publicity and education by sound movies, it has been a great deal easier to sell the idea to the men of the desirability not only of individual personal safety, but also the necessary cooperative spirit for a well rounded program of watching out for the safety of fellow workers. All of our underground men now use safety hats and shoes, and our statistics show that since the adoption of these two devices, many accidents to the head and feet have been eliminated entirely and others greatly reduced in severity.

Having once obtained the cooperation and confidence of the employees, many suggestions for making operations more safe have been volunteered by the men. Accidents on the haulage lines at one time occurred in frequent numbers, but one by one they have been eliminated, as have the serious accidents caused by falling rock. A great part of the credit is due to the individual employee; but do not forget that results would not have been obtainable if management had not awakened his interest and his desire to have for himself and his associates a safe place to work.

That our Missouri safety program is successful from a money point of view is shown by the total costs, including the Safety Department expense, of \$2.39 per \$100 of payroll, and it is believed that from a human point of view we also have a right to be very pleased, as the comparative numbers of lost-time accidents and deaths prove. In 1928 we had 320 lost-time accidents and five deaths; in 1929, 438 lost-time accidents and no deaths; in 1930, 304 lost-time accidents and two deaths; in 1931, 174 lost-time accidents and two deaths; in 1932, 123 lost-time accidents and one death; and in 1933, 70 lost-time accidents and no deaths.

In many small cities and towns throughout the United States, one of the large American companies may be the sole employer, and if so is usually the principal taxpayer. When such conditions exist, it is just as important to consider the safety of the community as it is to improve the safety of the individual employee. The management, therefore, must take an active interest in the general welfare of the locality. In the lead belt of Missouri the St. Joseph Lead Company is the principal employer, and in order that the communities in which the men and their families live might have the benefit of pure water, it has constructed an extensive system whereby the chlorinated mine water is delivered to the house and stores. The company has also built a dairy or pasteurizing plant, for the purpose of supplying a sufficient quantity of pure milk for the people, especially for the children. 63 per cent of the local real estate and property taxes have been used for building and maintaining schools, and in this way the primary and secondary schools in the lead belt have been developed until they are today among the best in Missouri.

With the assistance of the company, a local health unit was organized on July 1, 1922, in order to demonstrate the efficiency and economy of adequate health service for the prevention of disease and the promotion of public health. The group life insurance plan that was adopted by the company and given to its employees in 1919, and the formation of a definite pension program in 1914, have also proved valuable aids in the safety program, as they have aided in reducing the labor turnover.

It is also to be realized that a safety program or method that is suitable for one company or location may not be desirable for another company. For example in our two New York state mines, which have the same regulations regarding safety hats, shoes, goggles, etc., and where the primary rule is also enforced that each and every man is responsible for his own safety and for the safety of his fellow worker, great emphasis is placed on housekeeping or cleanliness about the mines and mills. Each department of the two divisions has a metal sign, ruled in three columns; one being for the month of the year, while the other two are for the housekeeping rating and lost-time accidents. If the conditions are good, a gold star is placed on the sign; if only fair a green star is awarded, while for poor cleanliness a red star is given. A gold star counts ten, a green five, and no score is given for red. These scores are posted monthly on the bulletin board, and the basis of comparison between the two mines is thereby made possible. If a score is not perfect, or at a reasonably high figure, the department which is negligent receives considerable adverse publicity. If there are no lost-time accidents, a gold star is placed in the accident column.

The results of our New York safety program are reflected by the achievement of operating 162,912 man-hours with only one lost-time accident (which incapacitated a worker for two days), and this record resulted in the 1932 award of the "Sentinels of Safety Trophy."

THURSDAY MORNING SESSION

October 4, 1934

The Dust Problem in Mining Operations

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The speaker said in part: Refuge can no longer be taken under the shelter of ignorance that the prolonged inhalation of dust may lead to serious disease, for the medical, technical and lay press is filled with accounts describing the dangers associated with breathing certain dusty atmospheres. What, then, should be the proper course to pursue in meeting this problem and dealing with it in a satisfactory manner?

Both industrial and laboratory studies prove that only certain dusts are dangerous when inhaled, and that quartz or other forms of pure crystalline silica are most dangerous, constituting a specific tissue poison. Where men are exposed to a sufficient quantity of very fine pure crystalline silica dust only, a true hazard always exists. The dusts of silica in combination with other elements generally give rise to pulmonary reactions which differ in many respects from those caused by pure silica, and which vary rather widely among themselves in their harmfulness. As a class, and with the notable exception of asbestos, silicates are less dangerous than pure crystalline silica. Not only are certain dusts apparently incapable of producing a specific harmful reaction when inhaled by themselves, but when associated with silica favorably modify the usual response to this dangerous dust. The effective size range of particles causing disease is now regarded as three microns and smaller, while the qualities of hardness and sharpness are no longer regarded as of significance. The term pneumokoniosis is intended to describe the changes arising out of the prolonged inhalation of any dust, harmful or otherwise, and does not necessarily imply the presence of disability, nor a predisposition to pulmonary infections. The term silicosis refers specifically to the disease which results from the prolonged inhalation of harmful silica dust, and is characterized by a generalized nodular fibrosis in the lungs and pulmonary lymph nodes, and increased susceptibility to pulmonary infections. Pure silicosis should be regarded as a genuine occupa-