

these chemicals. Patch testing persons with sensitizing materials may be a means of sensitizing them. Moreover, applicants found by patch tests to be sensitive, and therefore rejected, may have a legal claim against the company for having been given the skin eruption that otherwise they would not have had. There is, however, some basis for patch testing with the common allergens that cause so-called "atopic" dermatitis (house dust, flour, etc.) to discover sensitive individuals, although careful history-taking can bring out the fact of whether the person is or is not "atopic."

Careful note should be made of the sites of acne vulgaris lesions on applicants for work in occupations in which they are to be exposed to such occupational acne producers as the solid chlorohydrocarbons, cutting oils, heavy coal distillates, crude petroleum, and lubricants derived from it.

The presence of active mycotic infections on the feet and other parts of the body should be noted. If the applicants are otherwise employable, the fungus infections should be treated while they are working, and the parts affected should be properly protected from the action of occupational irritants. If there are common shower baths in the factory, care should be taken to prevent the spread of fungus infections of the feet. This can be done by providing each worker with wooden-soled bathing slippers, and he should be instructed to wear these when going to the shower bath, while he is under the shower, and when coming from it. It is not sufficient to have antiseptic solutions in troughs into which the workers are required to step after they have taken their showers, because walking barefooted from the troughs to the lockers allows plenty of opportunity for them to pick up and spread the infection. The workers should also be instructed to dry their feet thoroughly and spread powder between their toes before putting on their stockings. The fungi do not grow in dry media. There are many powders on the market for this purpose, and most of them contain some antiseptic, such as oxygen in the form of perborates and peroxides, and other fungicidal chemicals.

Applicants who have dry skins should not be placed on jobs where they must immerse their hands in fluids that defat the skin, such as strong soaps, alkaline solvents, or solutions of industrial skin irritants.

B. VENTILATION

Efficient ventilation is of great value in protecting the employees from industrial skin irritants. (for discussion of ventilation, see Chapter X).

C. PROTECTIVE CLOTHING

Properly designed protective clothing is of great value in the prevention of occupational dermatitis. Closely-woven-cotton-fabrics that are more or less impervious to dust are frequently used to protect workers from such irritant dusts as sodium carbonate, calcium cyanamide, and others. To give efficient protection such fabrics must be frequently cleaned. Each worker should have at least two sets of work clothes, so that he will have a clean set to wear while the other is being

cleaned. It has been found best to have the management of the plant undertake the laundering of such clothes because the worker himself is often loathe to spend the money. At one plant where such was the practice, it was estimated that it cost the plant about ten cents per day to furnish daily clean work clothes for each worker.

Impervious materials, such as rubber, offer better protection against dusts and irritant liquids, and they also give protection against irritant liquids. Rubber gloves, aprons, boots, and sleeves are impervious to water-soluble irritants. Rubber, however, soon deteriorates when exposed to alkalies, petroleum distillates, or the chlorohydrocarbon solvents. For this reason it is rather expensive to use in occupations in which it comes in contact with these chemicals. Synthetic rubbers, such as Neoprene, Buna-N, and Buna-S, are more resistant to alkalies and oils than is natural rubber. However, workers often object to wearing rubber garments; some say that rubber causes them to perspire excessively, and some of them are allergic to compounds in the rubber.

We have found that some of the synthetic resin films, such as Pliofilm (manufactured by Goodyear Tire & Rubber Co., Inc.), Koroseal (manufactured by The B. F. Goodrich Co.), and Vinylite (manufactured by Union Carbide & Carbon Corp.), are impervious not only to dust and fumes, but also to strong acids, alkalies, and petroleum distillates.³ These materials may be made into sleeves, aprons, hoods, and coveralls, and experimentally they have even been made into gloves. They are comparatively cheap, are nonflammable, may be easily cleaned with soap and water, and are translucent. This last property removes the psychologic effect of being confined. It is true that these substances, like rubber, prevent the circulation of air through parts of the body that they enclose, but this can be overcome by placing vent holes in the upper parts of the sleeves and in the rear of the coveralls, where such holes are not likely to allow the entrance of irritants. We have found that these films also give good protection against vesicant gases. They can be made with such tensile strength that, when worn as sleeves by machine operators, they will tear if caught by cogs before they can draw the arm of the worker into the machinery.

These films are affected by trichloroethylene and carbon tetrachloride and, therefore, are not suitable for protection against these substances. The polyvinyl alcohols are proof against trichloroethylene and carbon tetrachloride. They are manufactured in the form of gloves and called by the trade name Resistoflex. The polyvinyl alcohols are affected by water and, therefore, Resistoflex gloves should not be exposed to it. They may be cleaned with the volatile solvents.

Cellulose and cellophane can be plasticized with glycerin to form a pliable material capable of being made into protective clothing. They are not affected by acids or petroleum solvents. Cellulose acetate films are water-insoluble and make suitable protective clothing.

³ L. Schwartz, H. Warren, and F. Goldman, *U. S. Pub. Health Repts.*, 55, 1158 (1940).