an adult's way of looking at things, his notions of what he wants to get out of life, his feeling toward other men. Still it is not impossible.

Here are some of the ways attitudes can be changed.

One way to change a man's attitudes (and it is obvious in this case that somebody must change) is to search out the facts of the dispute by scientific methods.

Both sides in any industrial dispute must rely for strength in the show-down on the support of their constituencies and some of the public. Yet neither one acually knows what the men behind him really want. A scientifically conducted survey of what is wanted and needed by the stockholders, management, and the public would show each the limits of support on his side and just what he might concede without betraying his trust.

Psychological research and practical application in industry has demonstrated the value of "vertically organized" round-table discussion for producing attitude changes necessary to bring about industrial conciliation and peace.

This means bringing together not just the two top men in the dispute, but representatives of all the levels all the way down to the foreman who has direct contact with the workers and the shop steward who is the worker's adviser in dealing with management.

Such round-table discussions should be implemented with all the tools known to psychological science. Sometimes it is found that the words basic to the discussion are not understood by those involved. In one situation, tests revealed that the average supervisor failed to understand 80% of the words used in the contract under controversy. The average union's shop steward missed 70%. Attitude tests given before and after discussion show that the participants do change their attitudes as a result of frank discussion in such a round table.

What is needed to prevent strikes is the determination by management to use systematically what is known to science. They must realize that human nature is as real and important in their business as are dollars invested or machines and materials. They should pay as much attention and spend as much money on research in human and personnel relations as they do on product research.

Tension and hostility must be located and reduced before it piles up like static charges to produce an explosion and uncontrollable catastrophe.

Science News Letter, October 29, 1949

METEOROLOGY

Watch Smog Weather

➤ A STRICT watch of the weather is the chief of 10 U. S. Public Health Service recommendations for preventing future smog catastrophes such as hit the small industrial town of Donora, Pa., a year ago this month (Oct. 27, 1948).

If forecasts show a possibility of weather inversion, industrial plants should either be shut down or cut down their operations enough to reduce "sharply" the amount of contamination going out into the air.

A weather inversion, such as lasted five days in Donora last October, occurs when a layer of warm air settles over the ground air, preventing the usual updrafts.

The other nine Public Health Service recommendations have to do with reducing the gaseous and solid particle contamination of the air from both industrial plants and home heating plants, steam locomotives and steamboats. The recommendations come from an 11-month exhaustive study of the Donora situation. They presumably apply to other areas where a combination of air contamination and weather inversion produces smog.

Besides the 20 deaths at Donora last year, almost half the town's population were made sick by the smog, the Public Health Service scientists found.

With the Donora study giving "positive scientific proof" that contaminated air in industrial areas can cause serious acute disabling illness, the Public Health Service plans an expanded program for fighting air pollution.

The possibility of the mind being affected, in terms of reduced alertness and efficiency, from living in constantly polluted air, is one of the serious questions the Donora study has raised, Dr. Leonard A. Scheele, Surgeon General of the U. S. Public Health Service, pointed out.

A preliminary report of the study was given by H. H. Schrenk, Harry Heimann, George D. Clayton and W. M. Gafafer of the Public Health Service and Harry Wexler of the U. S. Weather Bureau.

Science News Letter, October 29, 1949

BOTANY-CHEMISTRY

Fertilizing, Fumigation Done in Single Operation

➤ A SINGLE spraying operation that kills plant pests and supplies plant foods at the same time was suggested to chrysanthemum growers.

At the flower show sponsored by the New York Botanical Garden and the National Chrysanthemum Society in New York, Dr. P. P. Pirone told of the recent development of a method of spraying plant nutrients directly onto the foliage instead of adding them to the soil. That was the old-fashioned way," said Dr. Pirone, a member of the Botanical Garden staff.

Although spray feeding is "still largely in the experimental stage" four or five applications weekly produce "vigorous, deep green foliage."

The newest insecticide for chrysanthemums, Dr. Pirone said, is the highly poisonous preparation called Parathion. It is almost totally effective against insects in one or two applications. Because it is dangerous to handle, he warned users to follow directions "to the letter" both indoors and out. By mixing Parathion, or the fungus-killer Fermate, with liquid fertilizer, "pest control and better foliage growth are achieved in one operation," Dr. Pirone pointed out.

For destroying the foliar nematode, a microscopic worm which blights chrysanthemum leaves, a solution of sodium selenate is applied to the soil. Because sodium selenate too is highly poisonous, Dr. Pirone cautioned against planting food crops in treated soil. Food grown on such soil will absorb some of the poison rendering it unfit for human consumption, he said.

Science News Letter, October 29, 1949

ENGINEERING

Coal Mine Safety Aided by Preventing Electric Arcs

➤ A FORWARD step in safety in coal mining comes from recent developments to prevent electric arcs or sparks jumping from power lines or car tracks to the tubing that brings air to the compressed-air blasting device now used in many mines.

Such arcs or sparks may cause explosions and fires in a coal-dust laden atmosphere. Details of two recent developments have just been released in a report of the U. S. Bureau of Mines which is available free from the publications section of the Bureau at Pittsburgh. It is entitled TWO DEVICES TO PREVENT ELECTRIC ARCS WITH AIRDOX OPERATIONS IN COAL MINES.

Airdox is a system of blasting out coal faces with compressed air instead of the usual explosives. Giving no spark, it creates no fire hazard. It is now in wide usage particularly in Indiana and Illinois coal fields. The breaking of the coal comes from the sudden release of the compressed air within an ordinary drill hole in the coal.

With the Airdox, compressed air is brought to the working area by steel pipes, and copper tubing carries it from a control valve to the Airdox shell at the coal face. The first safety device is a steel-reinforced rubber-jacketed tubi..g 50 feet long to replace the copper tubing. The second safety device is a coupling consisting of two small steel blocks with insulated bushings installed between the copper tubing and the steel line. Similar couplings are placed at 1,000-foot intervals in the air line. These will aid in preventing sparks at the face.

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