PUBLIC HEALTH

More Than 1,000,000 in U.S. Are Exposed to Silicosis

Not Often Fatal in Itself, Malady Opens Road for Tuberculosis and Other Very Serious Diseases

MORE than one million Americans are exposed to silica dust, the condition which may cause silicosis, sometimes called "miners' phthisis" or "miners' consumption," according to estimates of the U. S. Public Health Service.

Silicosis may affect not only workers engaged in rock cutting, as in the cases reported from Gauley Bridge, W. Va., which are attracting Congressional notice, but also those in the pottery, foundry, sand-blasting, abrasive, granite, tool and ax grinding, glass, slate, silica grinding and mining industries.

Not all those exposed to the dust get the disease, however. Probably one-fourth of any large group exposed to the dust at any one time have silicosis, and most of those have it in the early stage.

Very few people die of silicosis. Silicosis patients usually die of some infection, particularly tuberculosis, to which they are especially susceptible.

Men having silicosis in the first stage of the disease have slight or no disability, and may never have any disability, if placed in suitable surroundings. This does not mean that they must necessarily change their occupation. The surroundings in which they work can be made "suitable" by eliminating the silica dust from the air in which they work, or by reducing it to a safe limit. Men suffering from the disease in its second stage can improve materially, and even those suffering with the third stage of the disease can improve somewhat in "suitable" surroundings. The federal health service knows of no industry at the present time where the conditions causing silicosis cannot be controlled.

In silicosis the lungs, instead of being spongy tissues with plenty of space for the air to circulate, become mottled with patches of fibrous tissue which is dense and prevents the passage of air. As the disease progresses, the patient has less and less normal lung tissue for breathing.

Shortness of breath on exertion and sometimes a cough are the first symptoms of silicosis. In the early stages, however, the patients often do not know that they have the disease. They feel all right and are able to go on working and living normally. They even may and frequently do gain weight. It is when tuberculosis or some other infection sets in that the patients begin to lose weight and feel badly.

To prevent silicosis the U. S. Public Health Service recommends a combination of measures, no one alone being successful. These preventive measures are: methods of control of the dust at its source; good ventilation to dilute the amount of silica dust in the air; and physical examinations of the workers at the beginning of employment and periodically thereafter, to detect the presence of silicosis, and, even more important, of tuberculosis.

Conditions in practically all the silicosis-producing industries are definitely improving, according to the U. S. Public Health Service, but the surface has only been scratched and there is much dust yet to be controlled.

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PHYSICS

New X-Ray Technique Aids Against Silicosis

A NEW tool of science to combat industrial dust diseases like silicosis has been developed by Prof. George L. Clark and Dexter H. Reynolds of the University of Illinois.

Silicosis is the occupational disease caused by breathing rock dust containing fine silica, especially in the form of quartz, and is claimed to have been responsible for the numerous deaths at the Gauley Bridge, West Virginia, power tunnel now under Congressional investigation.

The new Illinois method is based on obtaining what amount to X-ray "fingerprints" of the quartz dust in a given sample of air from mine or factory. Not only is the kind of mineral present determined but the amount also is measured.

The dust from mine air is pulverized to a fine powder whose particles are smaller than one two-hundredths of an inch in diameter.

The dust powder is molded into a small wedge-shaped mass and placed in the X-ray analyzer. X-rays are then passed through the dust wedge and strike a sensitive photographic film which records an X-ray spectrum characteristic of the minerals composing the dust. This fingerprint spectrum tells what is present but without further research says nothing about the amount of each material present.

To determine how much quartz is in the sample of mine dust, a pure crystalline powder known not to be present is added to the sample in a given amount, say ten per cent.

The X-ray spectrum of this mixture is then recorded. The ratio of relative blackness of the X-ray lines of the known material to the blackness of the X-ray lines due to quartz in the dust samples is then determined. The ratio of line blackness is proportional to the amount of the quartz present in the dust, and can be converted into percentage amounts. The method is accurate to five per cent.

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MUSIC-PHYSICS

Photographs of the Voice Take Mystery From Singing

SOME of the mysticism is disappearing from the methods of voice training that yield the opera and concert singer through years of exacting study.

New facts about the mental imagery of singing by "getting it up"—"forward"—"against the teeth"—and "all through the head" are coming to light in studies being conducted at the Peabody Conservatory of Music at Baltimore.

When the voice teacher tells the aspiring voice student to "get the tone up" or "place the tone forward" or any one of a large number of similar figures of speech, he is attempting (often without realizing it) to secure relaxation of the swallowing muscles, says Wilmer T. Bartholomew of the Conservatory. These muscles often spoil good tone-quality by constricting the throat.

For six years the research department of the Conservatory has been studying voice production. Instruments like the oscillograph, which turn sounds of the singing voice into electrical impulses and make possible voice "photographs," have given definite facts regarding the

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characteristics of what is vaguely termed a "good singing" voice.

From the thousand and more oscillograph records a hitherto unreported frequency in the band of sound waves from E flat to F sharp of the last octave on the piano has been discovered in the well-produced voices of men. This is the "ring" of the voice, and occurs in considerable amounts, and at the same frequency, regardless of the fundamental pitch or the vowel being sung.

All the attributes of good vocal quality, declares Mr. Bartholomew, tend to appear when the throat is enlarged, as many voice teachers have long known. Such teachers use many types of mental imagery to help the pupil relax the swallowing muscles that tend to tighten the throat. Different types of imagery have equal success and appear to help in building up psychological aids in securing correct muscular settings, which is often awkward for the beginner.

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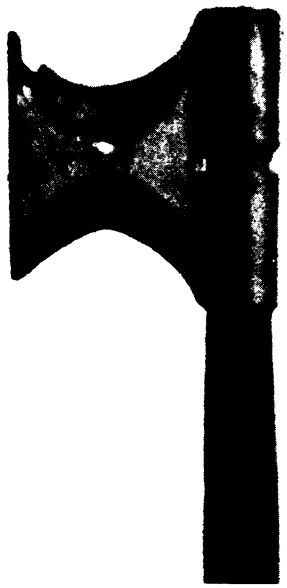

LIKE A LICTOR'S AX

AGRONOMY

Conservation Would Withdraw Same Acreage as A.A.A.

SOIL conservation rentals, to withdraw erosion-threatened land from the plow and put it into pastures, trees or other permanent vegetation, will retire just about the same number of acres as were taken out by the restriction agreements under A.A.A., if new legislation now pending before Congress is enacted.

At a conference in his office, Secretary of Agriculture Wallace disclosed this estimate, based on a survey made for him by the Soil Erosion Service last autumn, when the complete destruction of A.A.A. was not even thought of.

The survey was made of lands on unsafely steep slopes, now in the three big money crops, wheat, corn and cotton. The slopes are in the classes called C and D by the Soil Conservation Service. C slopes are those that must be put into grass to prevent their rapid ruin through erosion. D slopes cannot be saved even by permanent grass, but must be held by deeper-rooted trees.

The survey indicated that 35 million acres of the three crops are now being grown on such slopes. A.A.A. withdrawals in 1935 amounted to 30 million acres; in 1934 they were 35 million acres. The net result of the new scheme of acreage withdrawal, pointed especially at soil conservation rather than the elimination of price-depressing surplus production, would be to shift the uncultivated acres to places where they would do the most good to the nation's land itself.

Even these withdrawals will not wholly meet the situation produced by the destruction of America's foreign markets through ultra-nationalistic measures taken by European governments, Secretary Wallace indicated. To cut our production to this level, 50 million acres would have to be taken out of the major farm crops. Hope that such drastic action will never be necessary was expressed by the Secretary, who looks for a return, sooner or later, of "world sanity."

Even more sweeping cuts in acreage, to meet the soil erosion and soil exhaustion problems to the very limit, have been proposed by persons not connected with the Government. These have run as high as 30 per cent. of all our crop lands, and would mean reductions on the order of 100 million acres. This figure is not thought of as a serious possibility by Secretary Wallace.

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FORESTRY

New Foresters' Tool Looks Like Symbolic Fascist Ax

A NEW-TYPE tree pruning tool looking like the symbolic ax that thrusts its blade from among the bundle of rods in the Fascist emblem will soon be appearing on the shoulders of foresters going into American woods so that they can aid young trees to grow up straight and produce knot-free lumber.

The steel blade, however, will be a real working tool, not a political emblem. And it will not be an ax, for it will be sharpened not on its outer edge but at top and bottom.

The tool is the invention of J. H. Rich of Massachusetts State College. It consists essentially of a rectangular piece of steel, with half-moon-shaped concavities cut into top and bottom sides. These are whetted to razor edges. The blade is socketed on the end of a pole.

In use, the upper edge is first set against the under side of the branch to be pruned, and the forester gives it a quick thrust. Then he hooks the lower edge over the top of the branch, and gives it a firm pull. The two cuts meet, shearing the branch off cleanly. The forester swings the pole a little to one side so that the falling branch will not strike him, and goes after the next branch.

The tool is intended for use on small branches only, and will not replace the pruning saw for larger-sized jobs. But the inventor claims that it is much superior to the saw within its scope, particularly on branches from six to seventeen feet up the trunk.

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VETERINARY MEDICINE

New Hog-Cholera Vaccine Promises Better Results

PIGS WILL be better protected against their worst disease, hog cholera, by a new vaccine now under investigation by research workers of the U. S. Department of Agriculture. Crystal violet, a chemical not hitherto used in preparing such vaccines, appears to be the key to its greater effectiveness.

In preparing hog cholera vaccines in the past, three other chemicals have been used: glycerin, formalin and phenol. Vaccines generally are made by adding to blood serum containing the virus of the disease some chemical that will weaken its power to harm, yet not de-