

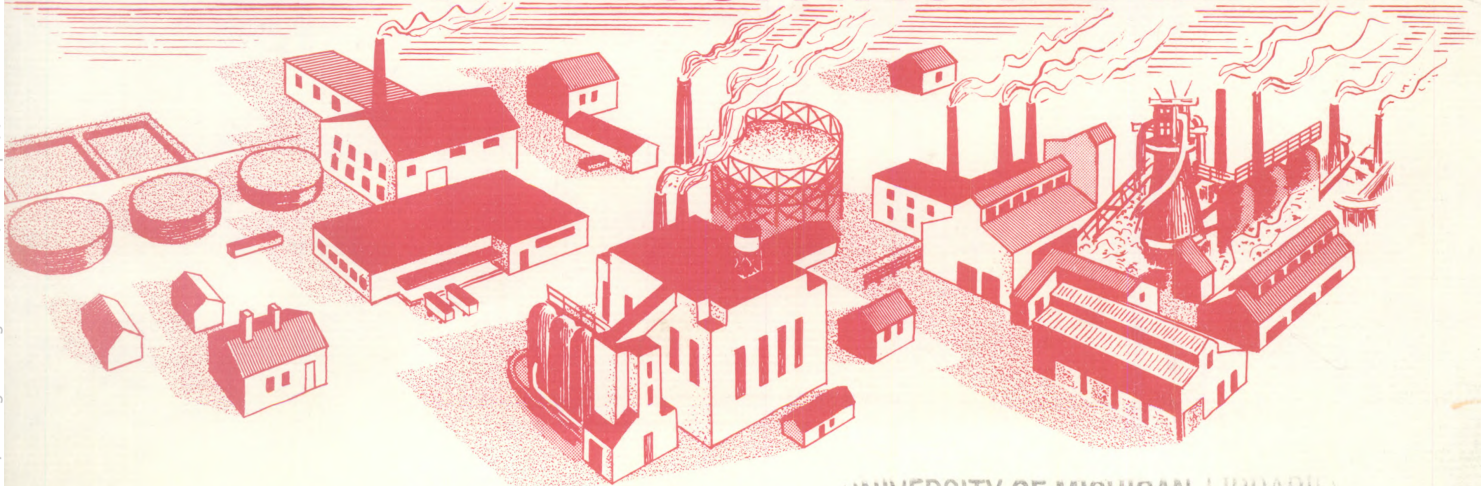
Generated at Harvard University on 2020-12-01 02:22 GMT / https://hdl.handle.net/2027/mdp.39015013148195
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-goo



B 687,179 DUPL

OF MICHIGAN
JAN 18 1907
PUBLIC HEALTH
LIBRARY

50 YEARS OF OCCUPATIONAL HEALTH



U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE — Public Health Service

UNIVERSITY OF MICHIGAN LIBRARIES

50

DEPOSITED BY THE
UNITED STATES OF AMERICA

YEARS OF OCCUPATIONAL HEALTH

50 YEARS AGO

In 1914, the U.S. Public Health Service established the Office of Industrial Hygiene and Sanitation to study the health problems of workers in the Nation's expanding industrial economy.

The Office was the predecessor of the present Division of Occupational Health, and its establishment marked the beginning of the Nation's occupational health program.

This booklet traces some of the significant developments affecting the health of American workers in this 50-year period of economic and social change.

U.S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
Public Health Service
Division of Occupational Health
Washington, D.C.
1964

50 YEARS AGO

At the turn of the century, the United States was still a predominantly agricultural country. But farm machinery and improved farming methods were steadily reducing the proportion of agricultural workers.

Mushrooming of cities signified the changing character of the Nation. When Lincoln was first inaugurated, fewer than one-sixth of the people of the United States lived in cities with populations of 8,000 or more. Forty years later, more than one-third of the people lived in cities of this size.

The Country Was Changing

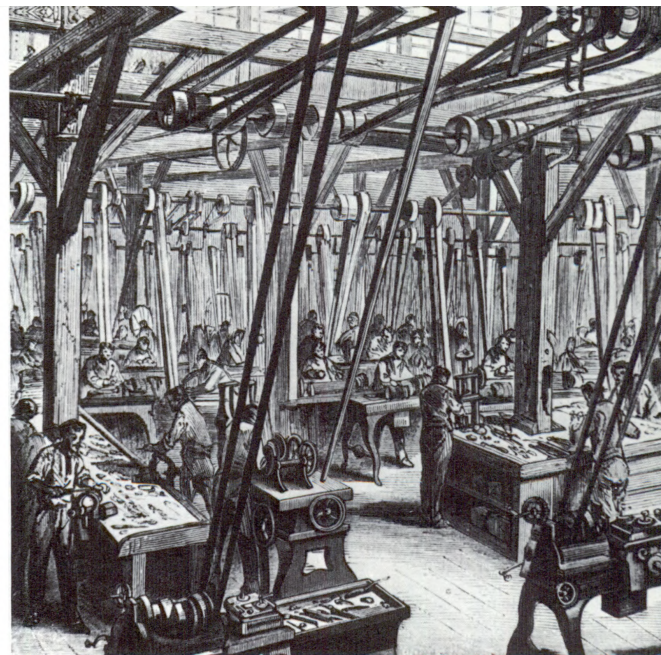
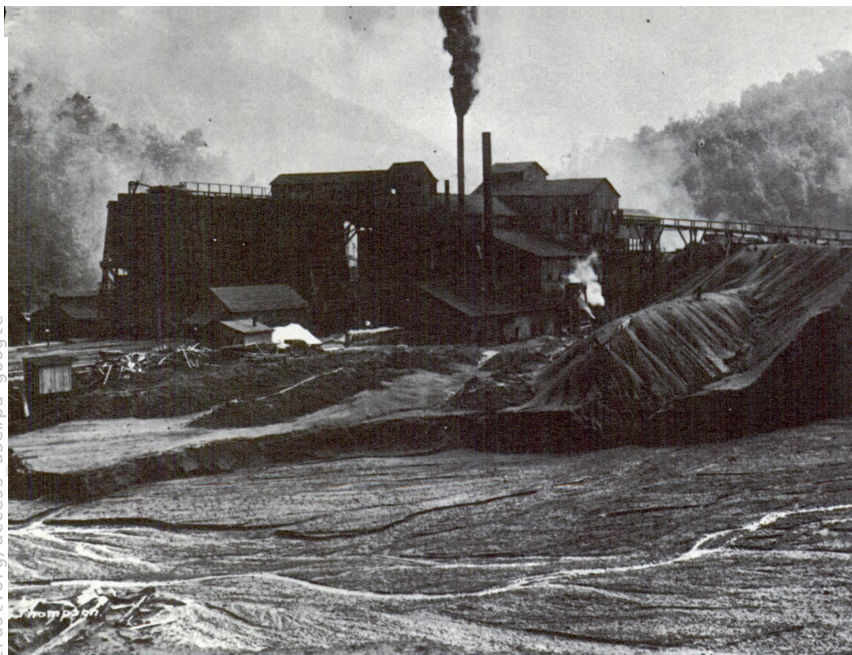




The American city itself was changing. Once it had been primarily a residential and trade center. Now, foundries, factories, and mills created a new industrial metropolis, whose towering smokestacks marked the coming of a new age.

Industrial plants provided work for the growing city population. In 1860, there were only about 1,500,000 industrial workers in the United States. By 1900, the number had risen to more than 5,500,000.

Generated at Harvard University on 2020-12-01 02:22 GMT / https://hdl.handle.net/2027/mdp.39015013148195
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google



The backbone of industry was the mining and processing of minerals. By 1900, the United States was producing more than one-third of the world's yearly supply of iron and steel.

Metals were fabricated into the machines and tools of the industrial age. In 1860, the United States had little more than one billion dollars invested in manufacturing. Fifty years later, this had risen to 12 billion dollars, and the value of manufactured products had increased 15 times over.

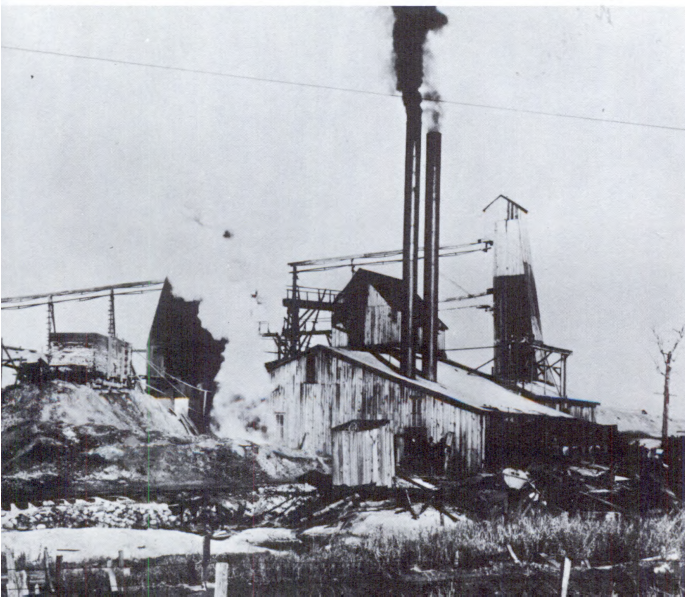
50 YEARS AGO

Industry expanded rapidly to keep up with the enormous demand for industrial products. Rapid growth fostered make-shift arrangements. More and more workers were crowded into old facilities, or flimsy additions were thrown up to accommodate expansion.

A great tide of immigration supplied needed workers to the burgeoning plants, factories, railroads, and mines. These new citizens also created a vast new market for manufactured goods. Between 1890 and 1914, over 16,500,000 immigrants from all over the world poured into the country. In one year alone, 1907, 1,285,000 persons began a new life in America.

Industry Was Growing

This industrial vigor was not yet matched by responsible action to protect the health of workers. Although there were stirrings of social awareness, occupational health practices in the early part of the century were almost non-existent



50 YEARS AGO

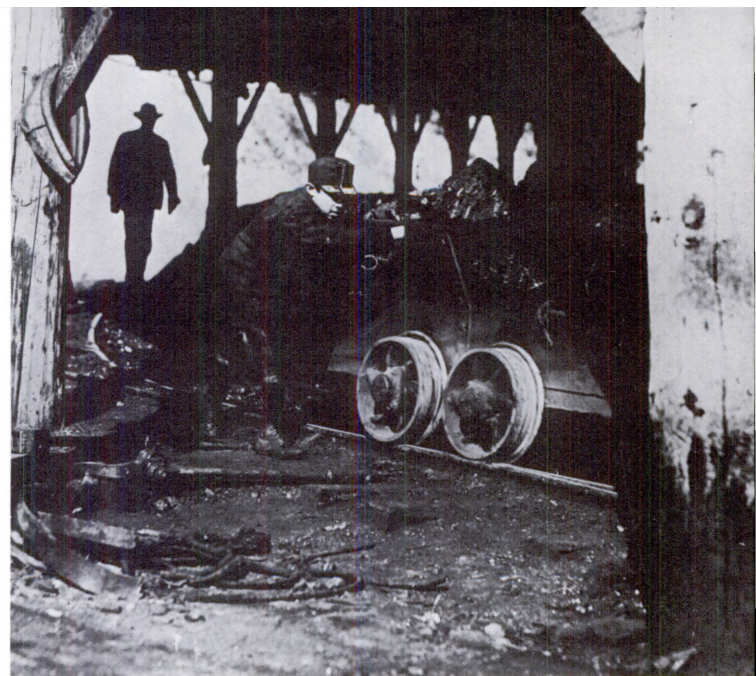
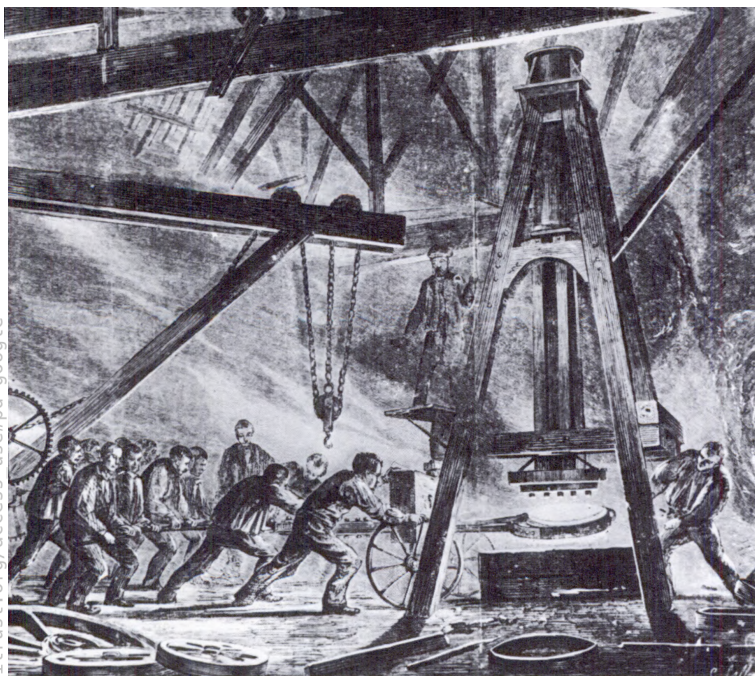
As the Nation surged ahead into the Industrial Age, ever increasing and expanding production became the goal of the new economy. The worker spent long hours of work in an environment contaminated by the dirt and wastes of the industrial process. Because few plants provided washrooms, he carried home these industrial wastes on his skin, and hair, and clothing.

Dust, grime, smoke, and noxious fumes were regarded as the necessary by-products of an industrialized society. Little was known, and few were concerned, about the effect of these conditions on human life, and employers were not legally responsible for the safety or health of their workers.

Working Conditions Were Hazardous



Generated at Harvard University on 2020-12-01 02:22 GMT / <https://hdl.handle.net/2027/mdp.39015013148195>
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google



Dirty, dusty conditions were not the only health hazards in the early factories. Extreme heat or cold, dampness, noise, bad lighting, poor ventilation, and overcrowding were common. One early observer remarked that “workers must be in excellent health when they begin—otherwise they couldn’t last a year.”

In some plants, children outnumbered adult workers. They labored under the same conditions and, like their elders, spent most of each day at their jobs. Twelve-to-14-hour work shifts—often seven days a week—were common.



50 YEARS AGO

Workers were aware of the health hazards in certain work. Such terms as “miners’ asthma,” “brass-founders’ ague,” “hatters’ shakes,” and “filecutters’ paralysis” were part of their language and experience. But workers had families to support, and dangerous jobs often paid higher wages. Many felt that to change jobs would be merely to exchange one set of hazards for another.

Employers realized that industrial workers suffered bad health and early death. But these misfortunes were usually attributed to the personal habits of the workers or living conditions in their homes.

Generated at Harvard University on 2020-12-01 02:22 GMT / <https://hdl.handle.net/2027/mdp.39015013148195>
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google

Medical opinion also tended to ignore the health aspects of work. Even when industrial diseases and disabilities were identified, they were ascribed to other causes. The statistical evidence, however, was overwhelming. The industrial worker's life span was short. In some trades, death in the 30's was common. In practically all trades, the worker's useful life was shortened, for many who lived into their 40's and 50's had serious disabilities which made work impossible.

The Workers' Health Was Ignored



OCCUPATIONAL HEALTH

The Early Years.....

Serious Health Hazards Existed



Following the establishment of the Office of Industrial Hygiene and Sanitation in 1914, the handful of physicians, chemists, and engineers who made up the Office sought to identify the health hazards that confronted American workers and to find ways to control occupational disease.

The first 20 years saw much pioneering research, as various studies probed the effects of the work environment on health.

The Public Health Service investigation of dust conditions in mining, stonecutting, and cement manufacture, begun in the early 1900's, was one of the first scientific studies of occupational health hazards. The study contributed much basic knowledge on silicosis and the other killing or disabling respiratory diseases which afflicted so many workers in the dusty trades. It also established the basic pattern for similar investigations in other industries. Study of the dusty trades continued, but twenty years were to pass before major disease-control measures were generally applied.

An early survey of a group of lead smelting plants employing about 7,400 workers revealed some 1,800 cases of lead poisoning. Lead had been recognized as a poisonous material since ancient times, but these 20th century plants provided no protection to workers. Thousands of workers in other trades using lead or lead compounds were also unprotected. Of 1,800 pottery workers studied, almost 22 percent suffered from lead poisoning.

In time, the lead-poisoning toll in industry was reduced with the introduction of preventive measures such as exhaust ventilation, regular medical examinations, and education of the worker.

.....in Mining

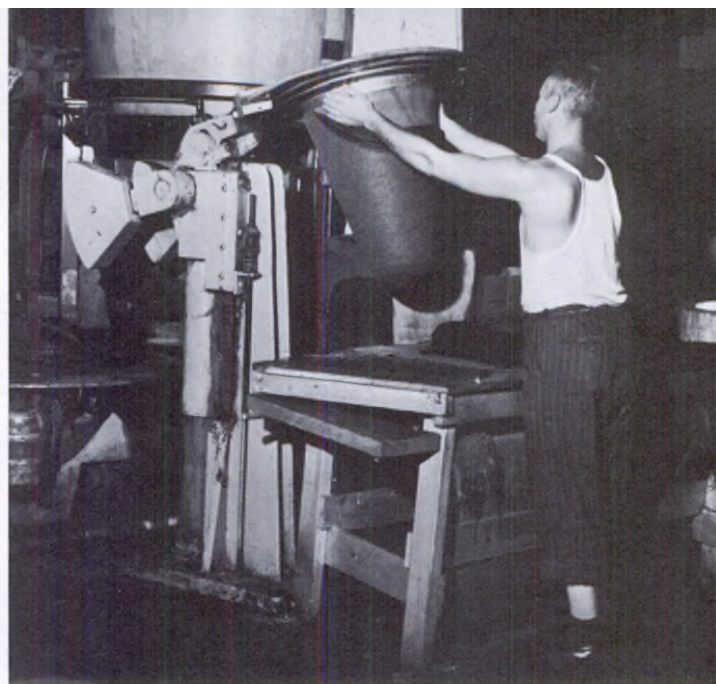


.....in **Sweatshops**

A 1914 study of conditions in the garment industry showed a high incidence of tuberculosis among the workers. Attention was focused on unhealthy working conditions—poor light and ventilation, overcrowding, and lack of sanitary facilities—which contributed to the high tuberculosis rate. The study helped to pave the way for abolishment of the “sweatshop.”

Labor Department investigators studying working conditions of women and children discovered 16 cases of phosphorus poisoning among workers in the match industry. Further investigation revealed an additional 150 cases, including four deaths. In 1912, shortly after the report was published, Congress placed a high tax on white phosphorus matches, and companies in the United States adopted the harmless substitute which the European industry had been using for years.





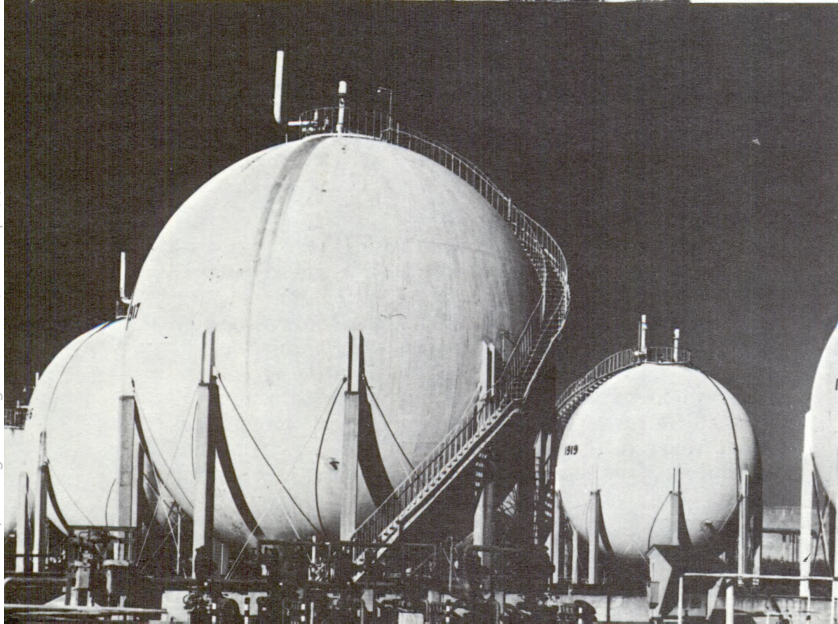
.....and Factories

During the 1920's there was a serious outbreak of radium poisoning in the watch industry. In one plant employing 800 persons, 48 cases of radium poisoning developed, with 18 deaths. In another plant, 20 died; sixteen were girls who painted the luminous dials, and four were chemists or physicists. Findings of occupational health studies led to the adoption of practices to prevent health damage.

Mercury poisoning had been notorious for centuries among workers in the felt hat industry, where mercury was used in solution to improve the felting quality of fur. The mental effects and characteristic tremors associated with mercurialism gave rise to the expression, "mad as a hatter." As recently as 1937, examination of 544 hatters employed in representative hat factories in the United States revealed that more than 10 percent suffered from some degree of mercury poisoning. Non-toxic chemicals have since replaced mercury in the felting process.



OCCUPATIONAL HEALTH COMES OF AGE



In 1935, the Public Health Service was able for the first time to begin development of an effective, national occupational health program. The Social Security Act of that year authorized substantial aid to the States for occupational health work. Only four States then had units specializing in industrial health. Through guidance and grants from the Public Health Service, these were improved and units established in other States.

The growing strength of the labor movement accelerated the drive for healthful working conditions and enlightened industrial leadership recognized the need for worker protection. Both labor and industry cooperated with Federal and State health authorities to control occupational disease.

As the public became more aware of potential hazards in the work environment, States began to provide for occupational disease coverage in their workmen's compensation laws.

America was on the threshold of a new age of technology, which brought with it new and complex health hazards for the worker and a great new challenge in the field of occupational health.

New industries introduced new and even more hazardous materials and conditions.

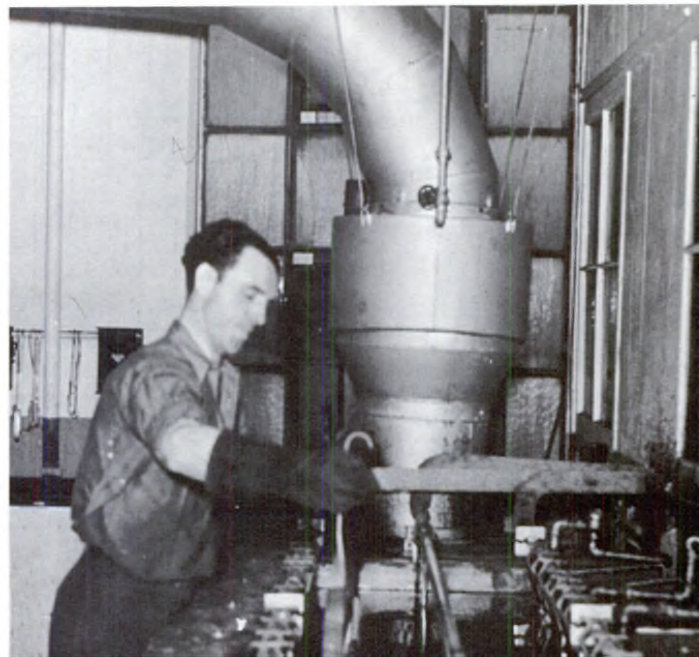
THE LATER YEARS

..... Metals

Old hazards reappeared in the new industries. Lead was used in the manufacture of storage batteries and rubber, and workers in these industries began to suffer from lead poisoning.

The development of X-ray tubes, fluorescent lamps, and many other new products introduced new materials into industry. These were often widely used before they were studied for toxic effects. Some, such as beryllium, manganese, cadmium, and selenium, proved to be highly dangerous when used without adequate protection.

Certain chromium compounds—the chromates and bichromates—became essential to many industrial processes and were widely used in electroplating, photography, and leather tanning. Skin lesions and ulcers were common among chromate workers, and the cancer rate was much higher than among workers in other industries.

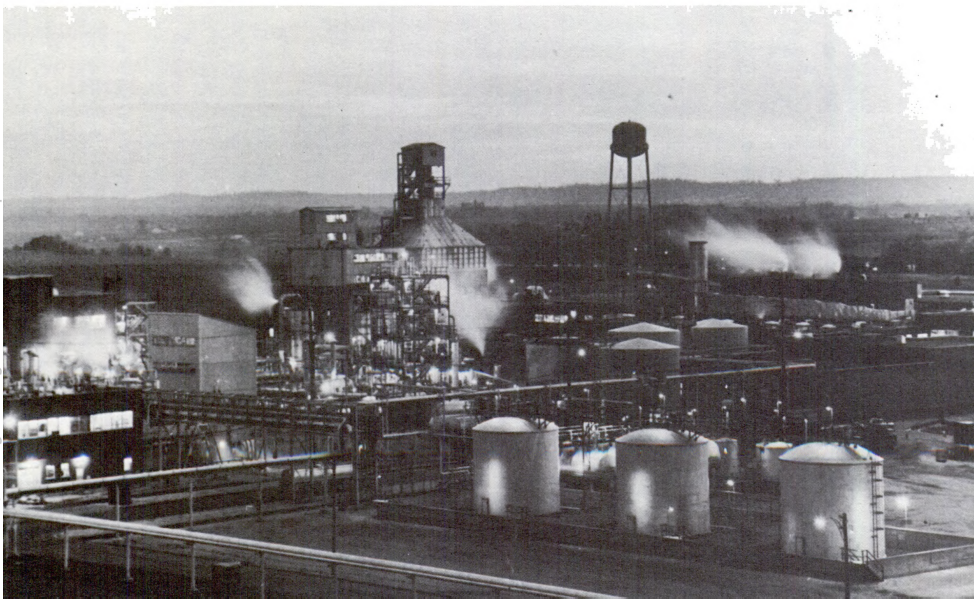


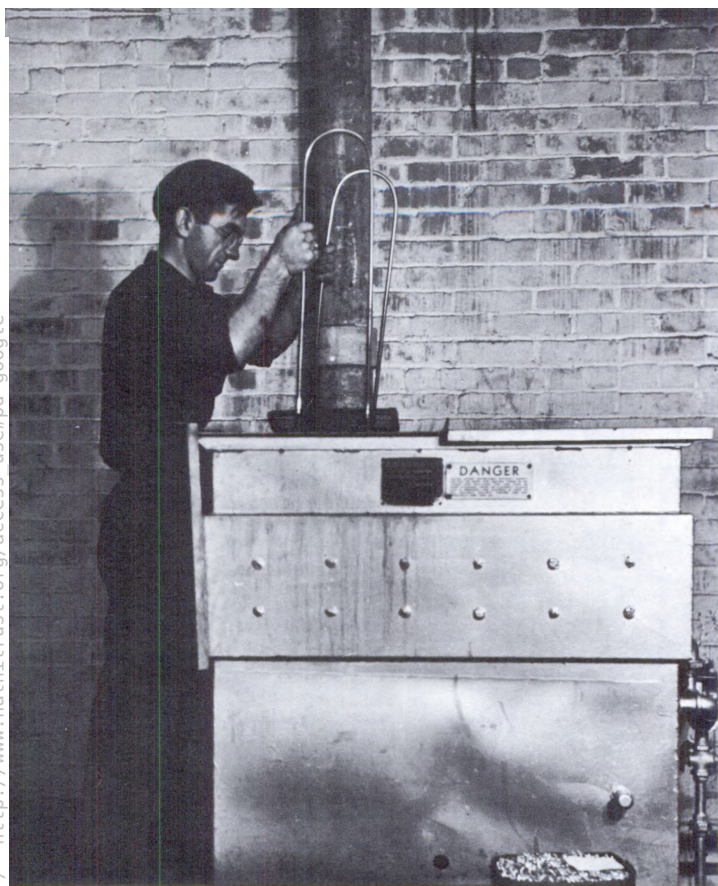
THE LATER YEARS

..... Petroleums and Chemicals

The giant petroleum industry helped to change the face, and the pace, of America. Automobiles, airplanes, and the fuels that powered them, revolutionized transportation. No industry had ever before produced such a variety of useful—and potentially dangerous—materials. A multitude of petroleum by-products—paraffin, oils, solvents, greases, dyes, pigments, insecticides, and drugs—brought unfamiliar hazards to the worker.

Solvents, including naphtha, benzene, alcohol, acetone, and many others, were used in thousands of new industrial processes. These ranged from the extraction of oil from vegetable meals to the production of plastics, paints, explosives, and pharmaceuticals. But the same volatile properties that make solvents so useful as cleaners, thinners, and dryers also made them dangerous when used without adequate protection.





The modern chemical industry, based largely on petroleum, soon surpassed even its parent industry in the number and variety of its products. The magic wrought by chemical research transformed American life with synthetic fibers, plastics, and antibiotics. The products of chemistry gave birth to whole new industries, where hundreds of thousands of workers could suffer if the new compounds proved dangerous.



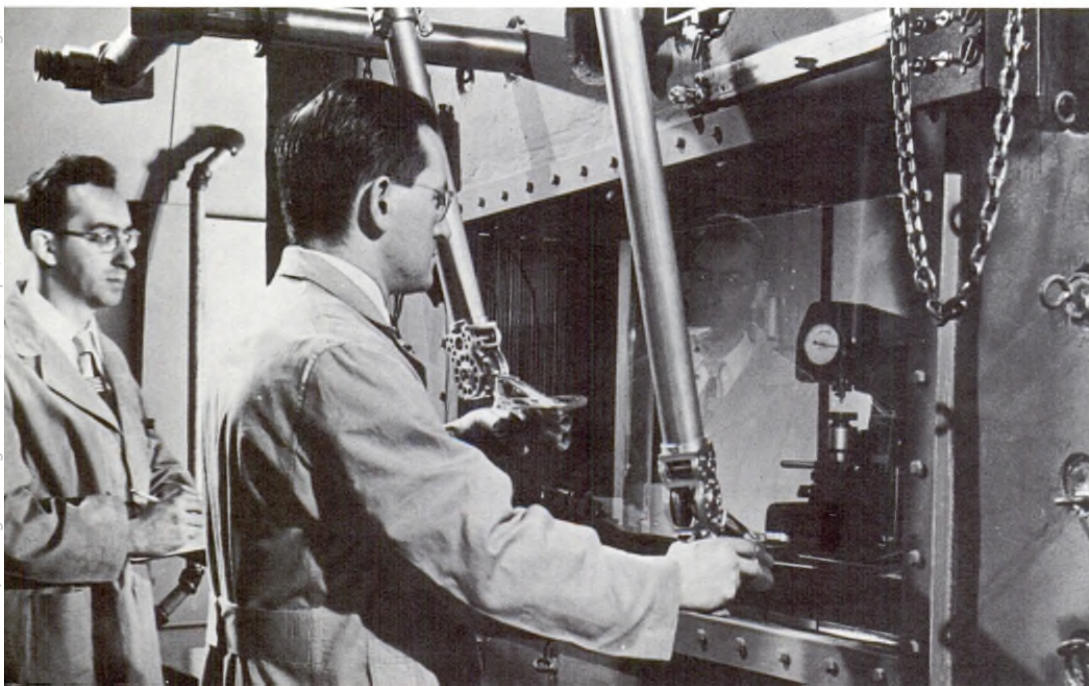
Products of the chemical industry made farming a scientific, and potentially hazardous, occupation. Each year, millions of tons of pesticides, animal feeds, and fertilizers are used by farmers. The widespread use of chemicals, together with the use of machines, subjects the modern farmer to many of the hazards faced by the industrial worker.

THE LATER YEARS

...Radioactive Materials

With the harnessing of nuclear energy, thousands of workers were using radioactive materials with safety. Earlier experience with radioactive substances, such as those used in the watch industry, had made protection possible.

However, the dangers of radioactivity revealed themselves in a new work environment. On the Colorado Plateau, miners and mill workers faced hazards in producing uranium for America's atomic industry. In 1950, at the request of the ore-producing States, the Division of Occupational Health, in cooperation with other Federal and State agencies, began a long-term study of the uranium industry. Radon, a radioactive gas several times as heavy as air, appears to be the most serious health threat in uranium mining, and techniques to reduce the danger of radiation have been applied in many mines as a result of the study. The investigation is continuing to develop new knowledge which will help our own and future generations work safely in the Atomic Age.



Generated at Harvard University on 2020-12-01 02:22 GMT / https://hdl.handle.net/2027/mdp.39015013148195
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google

OCCUPATIONAL HEALTH TODAY

Today, more Americans are at work than ever before. Although hazardous materials are still widely used, knowledge and experience gained over the years have shown that workers, even in the dangerous trades, can enjoy the benefits of a long and vigorous life.

Industry and labor have joined forces to maintain healthful working conditions. Availing themselves of the latest advances in worker health protection, they draw on State and local health authorities, as well as other available resources, for advice and assistance. Workers and management cooperate in the clinical and environmental studies of the Division of Occupational Health, knowing that its impartial findings will help to assure a healthy, productive work force.

However, the danger of industrial poisoning has not vanished completely. Research in toxicology can scarcely keep pace with the rapid introduction of new, and potentially hazardous, materials into industry. Furthermore, our knowledge of the long-range effects of toxic exposure is incomplete.

New processes, new sources of energy, and the psychological and social stresses of the modern age are creating unforeseen problems of a type and complexity never before encountered in any consideration of worker health.

Although the health of the American worker is better than it has ever been, old and new health hazards related to his occupation still exist—and are often ignored because of misunderstanding, apathy, or overconfidence. Where the science and skill which created America's industrial miracle are applied to the problems of occupational health, the worker's health may be protected, and even improved, by his work environment.

Generated at Harvard University on 2020-12-01 02:22 GMT / https://hdl.handle.net/2027/mdp.39015013148195
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google

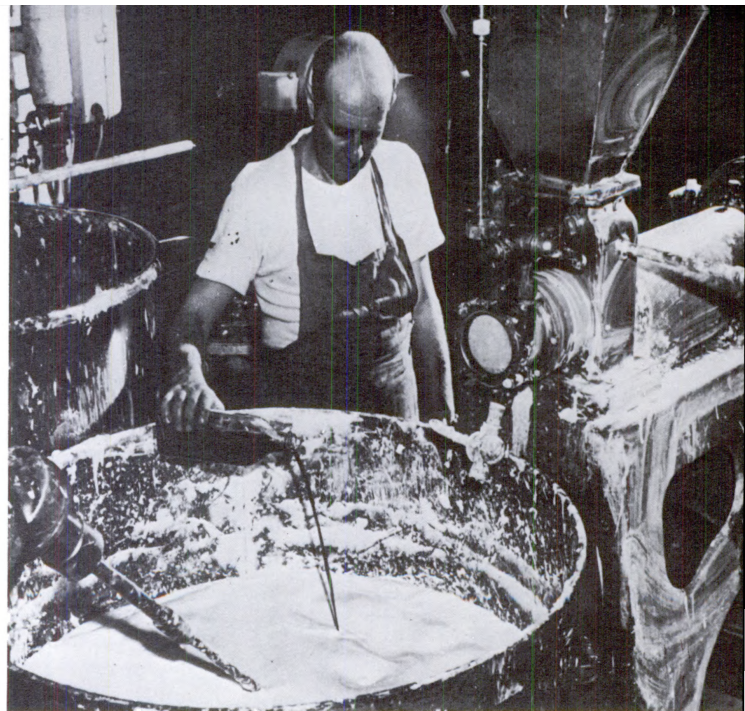
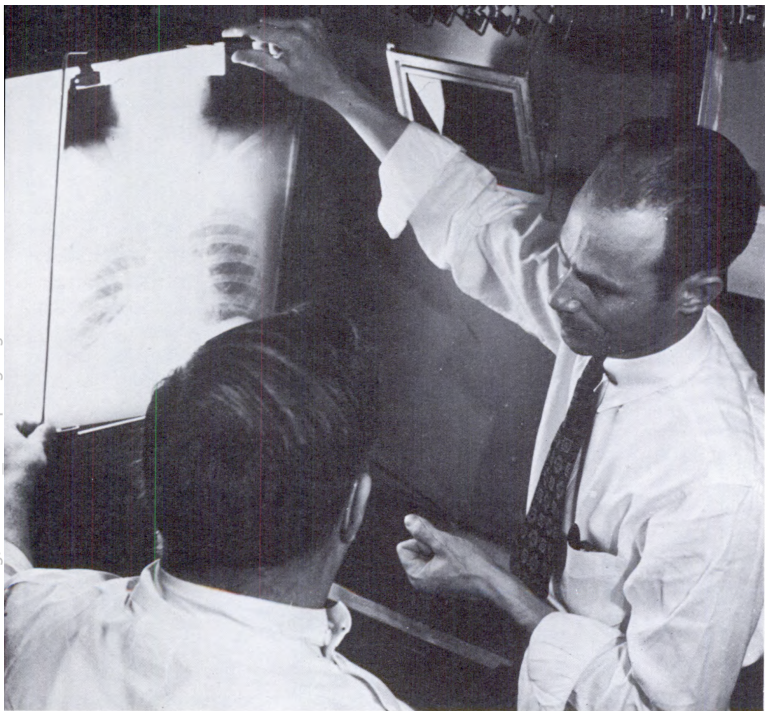
TODAY

In large modern plants, most of the old hazards have been eliminated or controlled, and new processes and materials are carefully studied. Safety standards have been established for many kinds of work and are constantly reviewed to give workers better protection. As a result of such precautions, acute large-scale poisonings, common 50 years ago, rarely occur today.

Using modern protective devices and equipment, workers now handle dangerous materials with safety. In fact, because of the protection they are given, workers using hazardous materials are often healthier than those in the less dangerous trades.



Generated at Harvard University on 2020-12-01 02:22 GMT / https://hdl.handle.net/2027/mdp.39015013148195
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google



We Know More About Health Hazards

Many plants have their own programs to prevent occupational disease and injury and to treat them when they do occur. Some have established outstanding records of protecting their workers from health damage. Many companies have found that occupational health programs are excellent investments because they reduce costly absenteeism and even increase production. Although most programs were established to provide only emergency care or treatment for occupationally related problems, the programs tend to expand to include preventive health services.

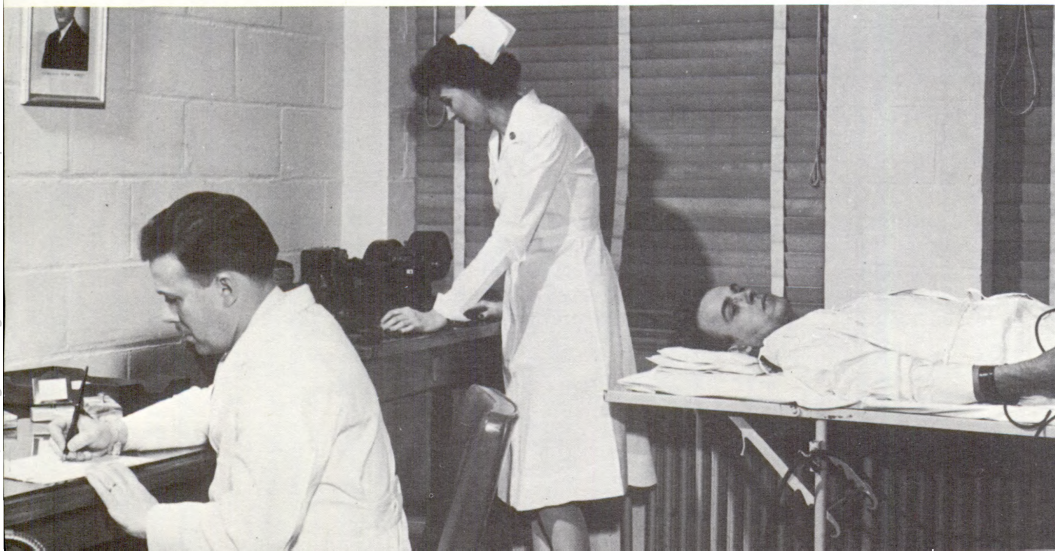
However, even in this age of great industrial operations, most American workers are employed in small plants—those with less than 500 workers. Few of these provide adequate health protection. A large part of the States' occupational health work is directed toward improving conditions in these plants and encouraging the development of preventive health programs.

TODAY.....

Now, most States, as well as Puerto Rico, have occupational health agencies, and some local health departments have established units devoted to work-related health problems. Industrial groups and private organizations also work to promote occupational health. However, a great many State agencies have less than one professional staff member per 100,000 workers in the State, and most States do not even require the reporting of occupational disease to the health department. Although, more and more, the efforts of occupational health units are directed toward *preventing* the development of hazardous conditions, their limited staffs must still spend much time *correcting* hazards which have already threatened the health of workers.

In schools of public health, young physicians, chemists, physicists, toxicologists, engineers, and industrial hygienists receive special training for work in various areas of occupational health. Occupational medicine, for example, has become one of the newest and most challenging specialties in the field of medicine. Even so, a shortage of trained personnel, particularly nurses, continues to be one of the most serious problems in occupational health today.

We're Doing More About Occupational Health



Generated at Harvard University on 2020-12-01 02:22 GMT / <https://hdl.handle.net/2027/mdp.39015013148195>
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google

THE ROLE OF THE DIVISION OF OCCUPATIONAL HEALTH, 1964

The Division of Occupational Health of the U.S. Public Health Service directs its major efforts toward

DEVELOPING KNOWLEDGE

Research is performed to develop means for preventing, diagnosing, and treating occupational diseases.

Studies are carried out to determine the health status of the American labor force and the impact of the working environment upon it.

APPLYING KNOWLEDGE

Technical assistance is given to help Federal, State, and local agencies plan occupational health programs and solve complex problems requiring specialized staff and equipment.

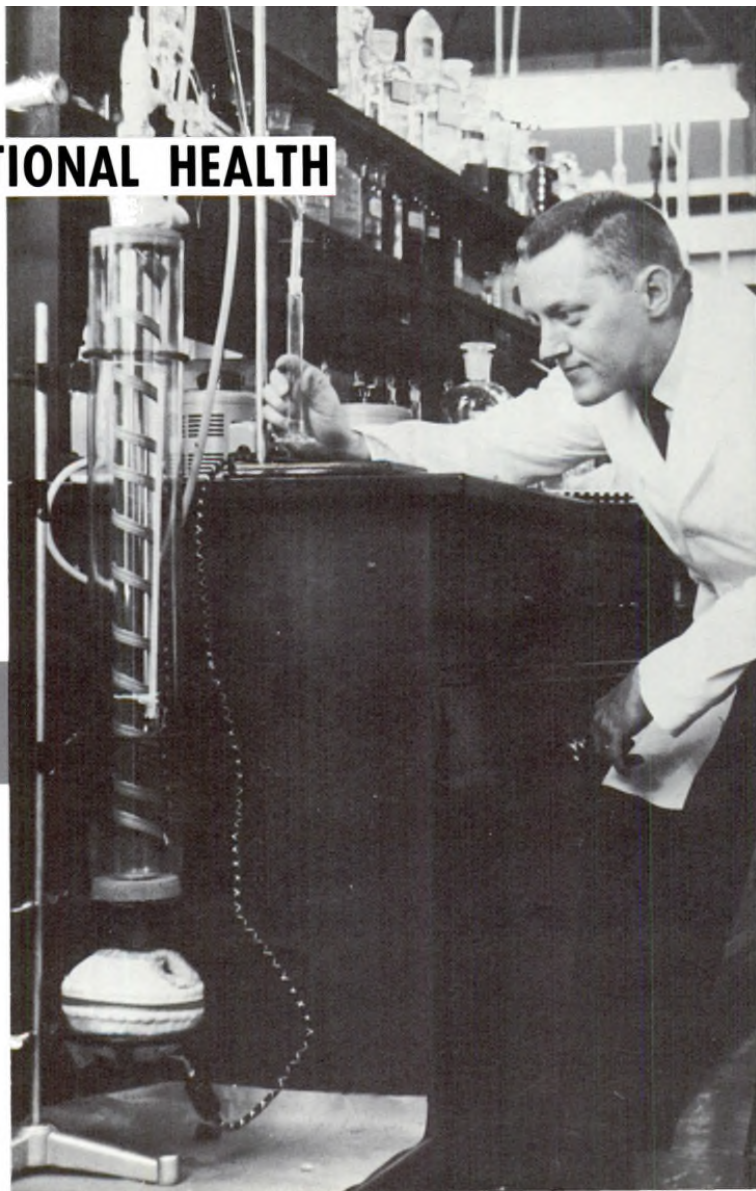
Education and training are provided to assure that current developments in the prevention of occupational diseases are known and utilized.

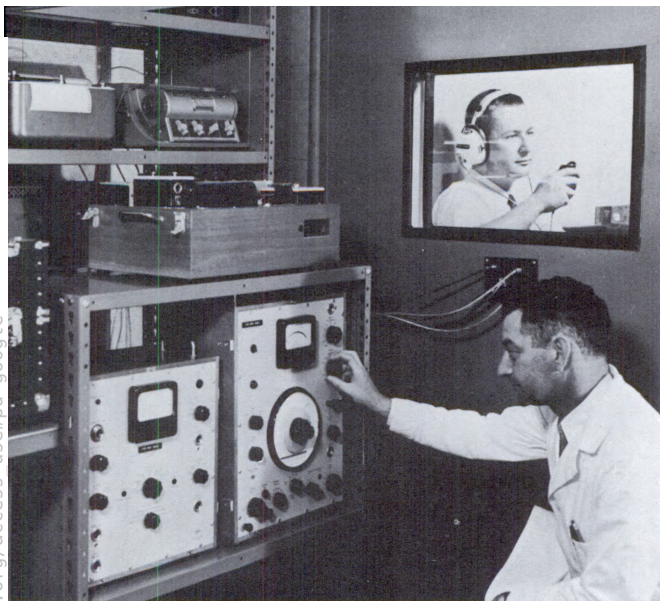
Generated at Harvard University on 2020-12-01 02:22 GMT / https://hdl.handle.net/2027/mdp.39015013148195
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google

THE DIVISION OF OCCUPATIONAL HEALTH

One of the most serious problems in occupational health today is the potential toxicity of the flood of new materials being used in industry. Most have been tested to provide only an approximate hazard rating for ordinary conditions of use. Some are safe enough when used alone but become toxic when combined with other materials. Much of the laboratory research work of the Division of Occupational Health is aimed at learning more about the subtle or long-range effects some of the new materials may have on the health of workers, or on the health of future generations. Increased attention is being given to investigation of the basic mechanisms by which substances produce toxic effects and by which bodily tissues respond.

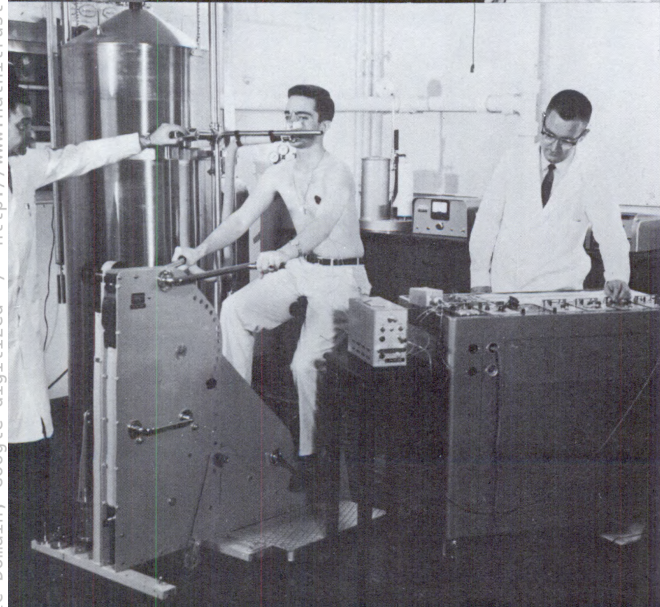
RESEARCH





The Division continues to study the effects of the working environment on the health of workers through field investigations, clinical and environmental studies, examination of statistics, and experimentation. As understanding of these effects increases, the studies tend to broaden. Research on industrial noise, for example, was originally concerned only with the effect of noise on the hearing of workers. Now it has become important to discover what effects noise may have on the worker's ability to learn, or to perform, difficult tasks.

STUDIES



New studies reflect both the new technology and a growing concern for worker health. Current investigations range from measuring psychological and physiological stresses—which are becoming increasingly serious problems as more and more mechanization and automation appear in industry—to exploring the relationship between work and some of the more common diseases and disabilities never before associated with the work environment.

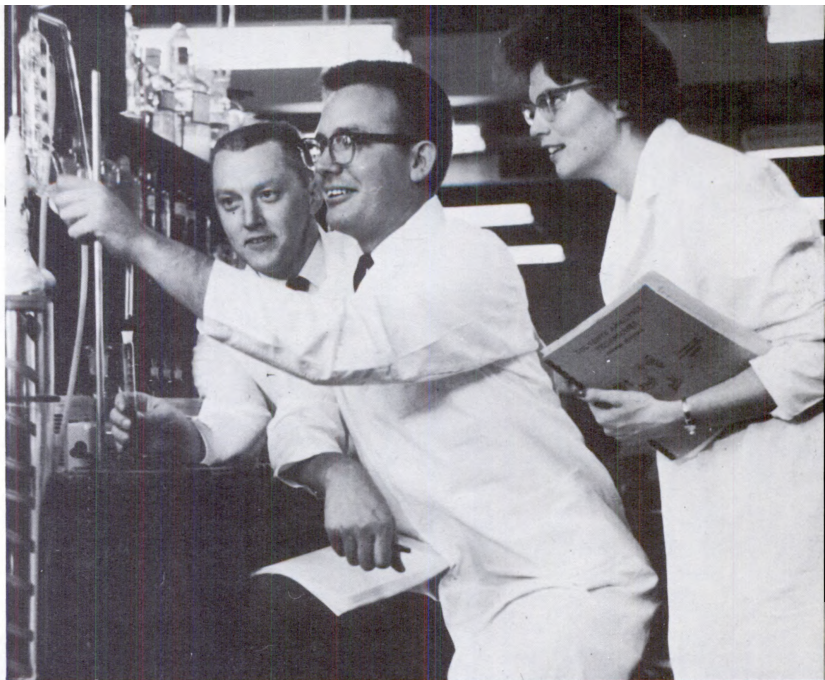
THE DIVISION OF OCCUPATIONAL HEALTH

The Division of Occupational Health helps the States plan the broad preventive programs needed to maintain the health of workers in modern industry. Through the States, it furnishes similar assistance to employers, occupational health specialists, and labor unions. Skilled technologists provide assistance in solving special problems.

TECHNICAL ASSISTANCE AND CONSULTATION

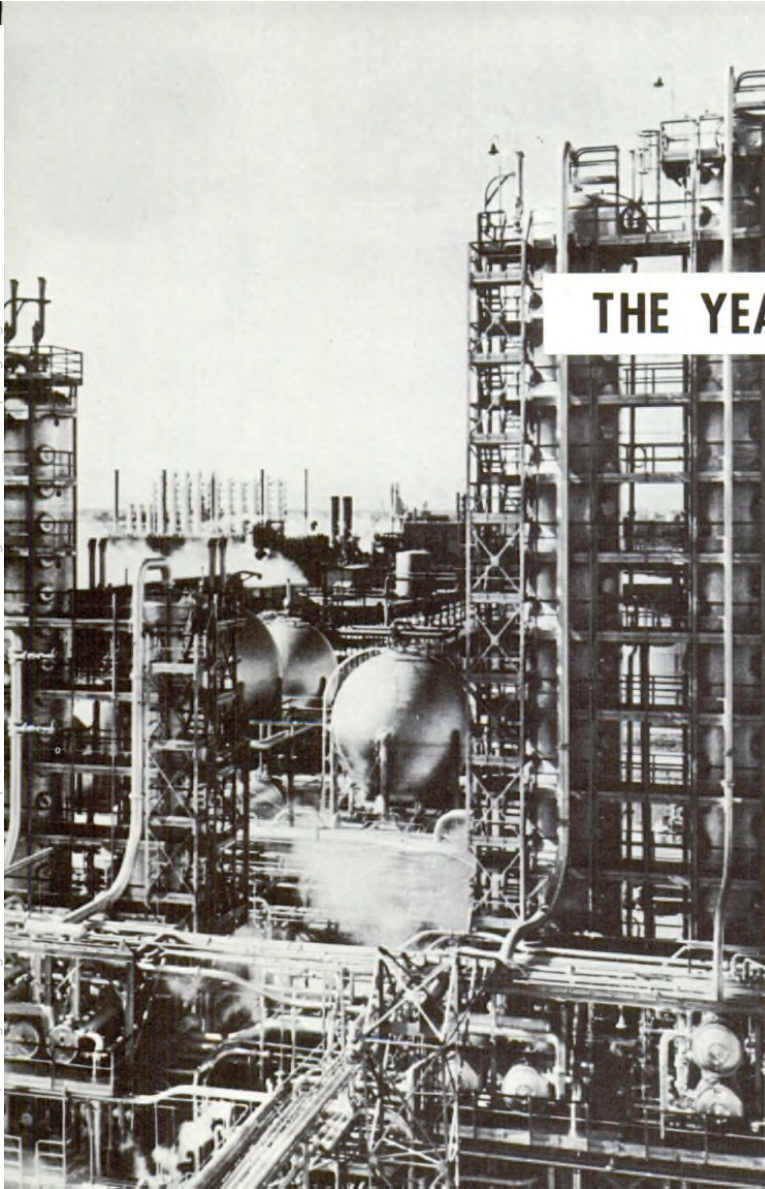


To those who can apply it, the Division passes on all the experience and knowledge gathered in its research and investigations. Through its publications and short-term training courses, it endeavors to insure that latest developments in the detection and control of health hazards are understood and used.



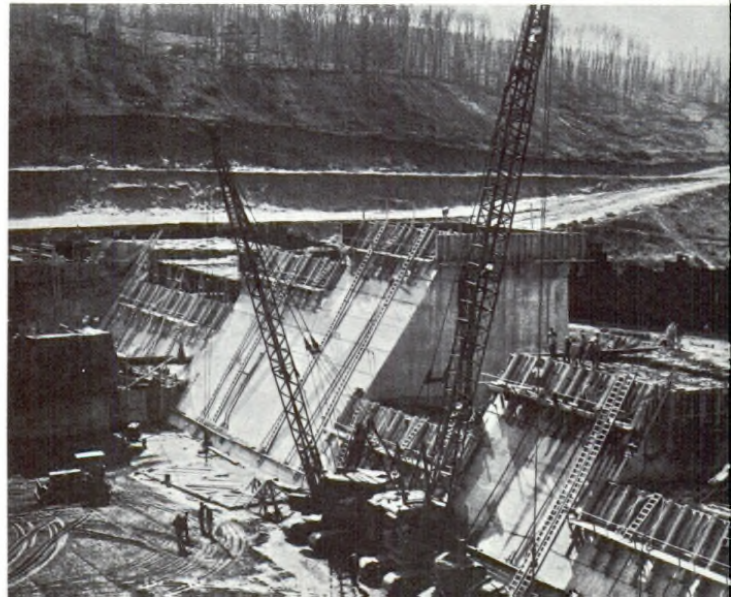
EDUCATION AND TRAINING

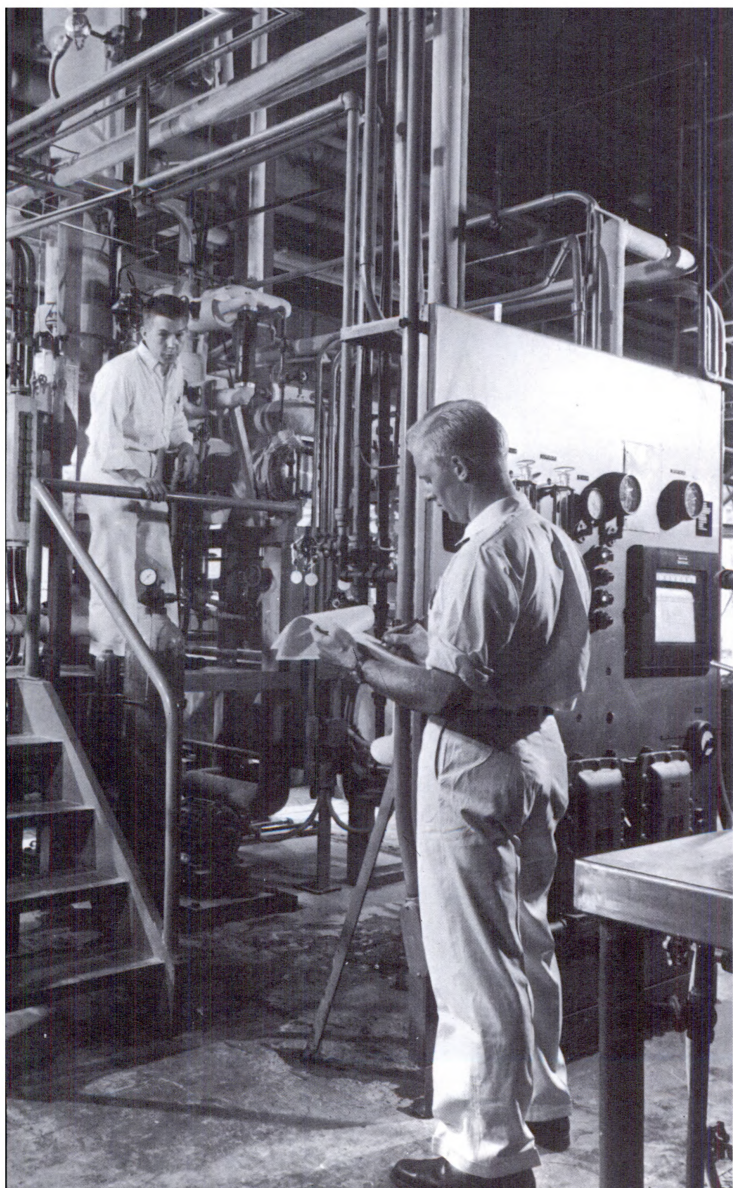
Generated at Harvard University on 2020-12-01 02:22 GMT / <https://hdl.handle.net/2027/mdp.39015013148195>
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google



THE YEARS AHEAD

In an industrial society, industry serves as a giant laboratory where scientists can see and study, in the developing stage, the environmental conditions which will affect the entire society.

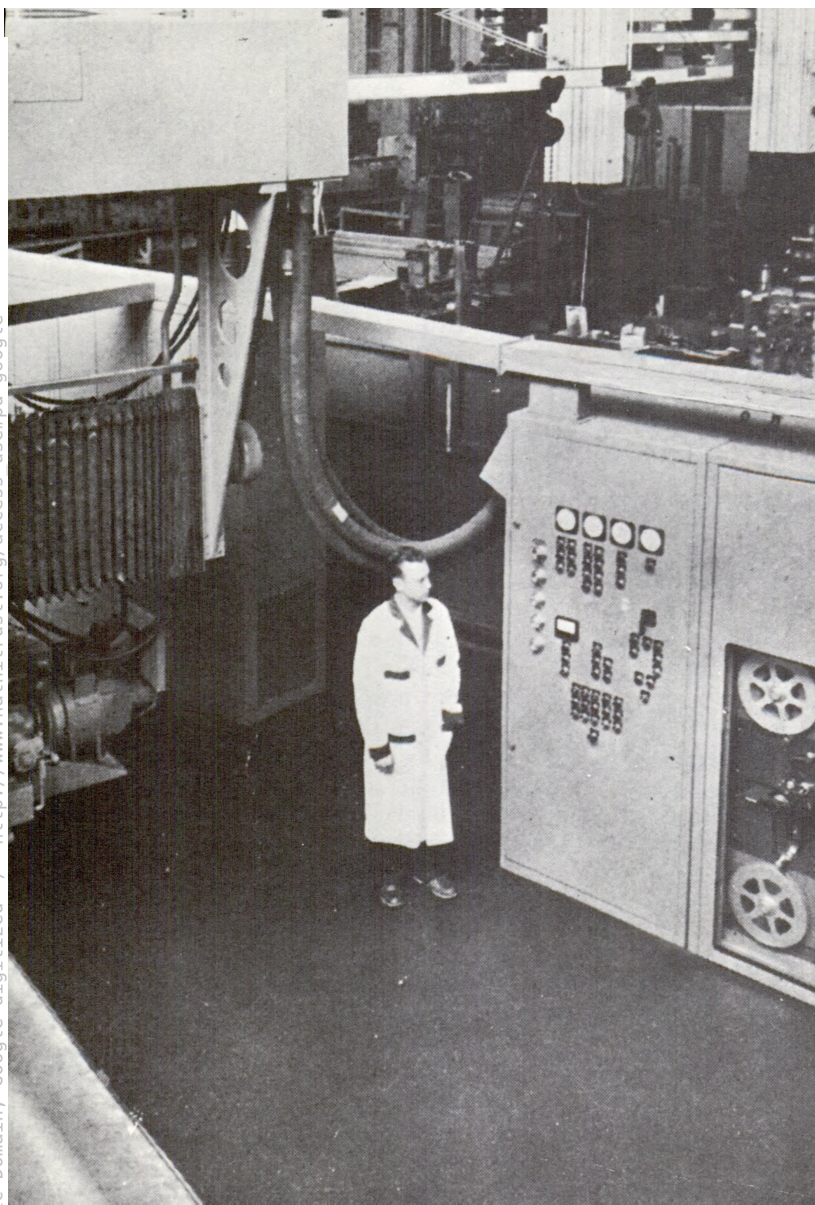




Man and the Total Environment

Protection of the worker from new and hazardous materials will continue to be a serious problem in the years ahead. However, we have already learned that man can work safely with such materials when scientific protection is provided. As the impact of these hazards is reduced, other factors, both within and outside the work environment, emerge as important influences on the health of workers. The effects of occupational exposures do not end at the close of the workday. Similarly, the social, psychological, and physical influences of the non-work environment carry over into the work situation.

We have come to understand that the total environment affects the total man.



THE YEARS AHEAD.....

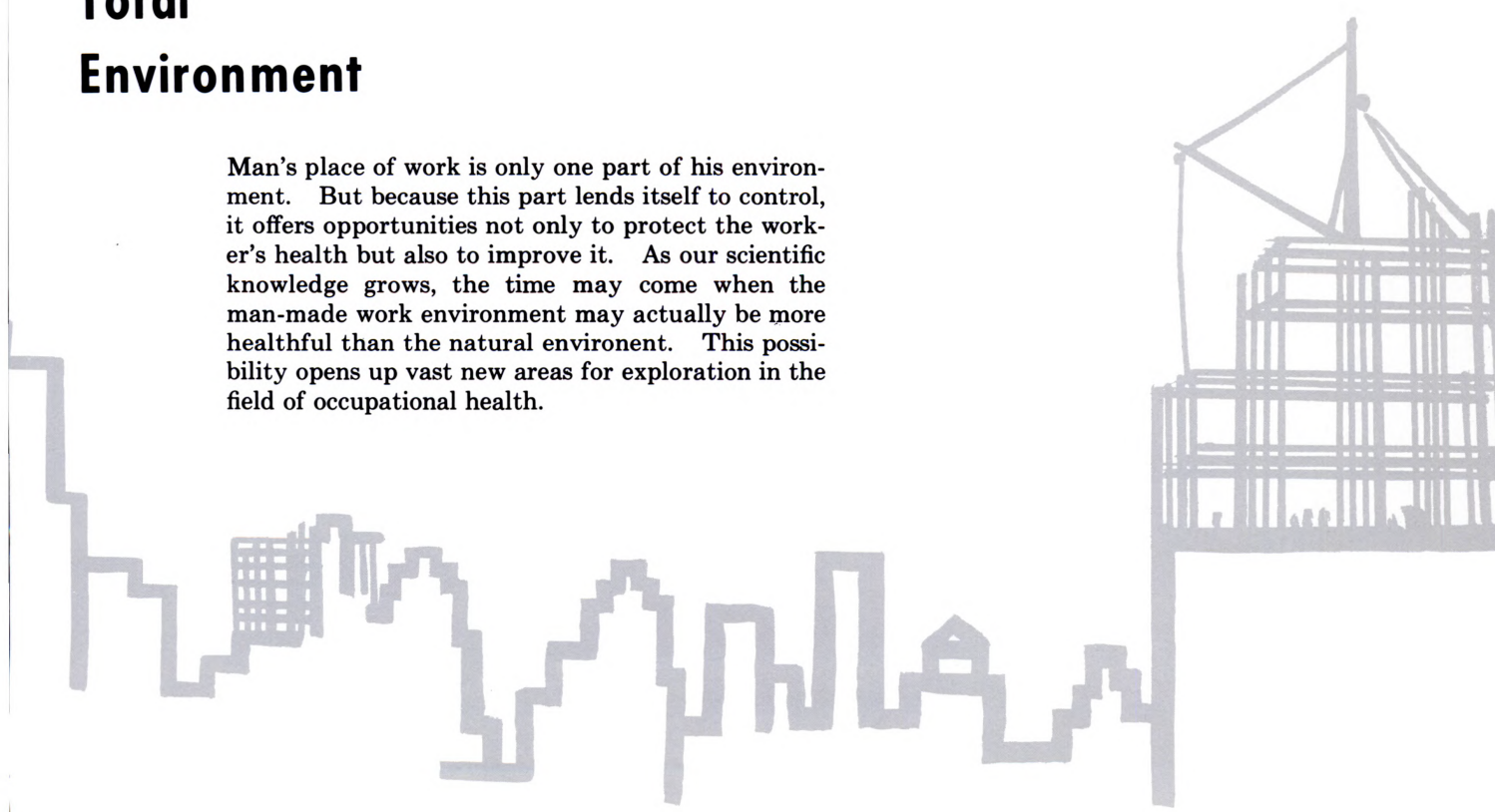
The Man-Made Work Environment

Man's work environment will continue to change—even more rapidly and radically than in the past. Man is creating for himself a new environment, symbolized by the push button, the electric eye, the computer, the space capsule. Problems of temperature, noise, light, vibration, and boredom and psychological stress, loom large in the occupational health challenge of the future. Serious questions have been raised as to the ability of the human organism to adapt itself to the rapid changes of the present—or even to survive in the man-made environment of the future. The rise in psychosomatic ills which has paralleled our industrial growth suggests that we have already begun to feel some of the effects of our changing environment.

Generated at Harvard University on 2020-12-01 02:22 GMT / <https://hdl.handle.net/2027/mdp.39015013148195>
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google

Work and the Total Environment

Man's place of work is only one part of his environment. But because this part lends itself to control, it offers opportunities not only to protect the worker's health but also to improve it. As our scientific knowledge grows, the time may come when the man-made work environment may actually be more healthful than the natural environment. This possibility opens up vast new areas for exploration in the field of occupational health.



“Man is not the creature of circumstances. Circumstances are the creatures of men.”
—Disraeli

U. S. GOVERNMENT PRINTING OFFICE : 1964 O-729-420

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C., 20402 - Price 25 cents



Public Health Service Publication No. 1171