

# OHS

OCCUPATIONAL HEALTH & SAFETY



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Making working conditions healthy and safe is in the interest of **workers**, **employers** and **governments**, as well as the **public** at large.



Although it seems simple and obvious, this idea has not yet gained meaningful universal recognition !!!

Hundreds of millions of people throughout the world are employed today in **conditions that breed ill health and/or are unsafe.**



Each year, work-related injuries and diseases kill an estimated **2 million people worldwide**, which is greater than the global annual number of deaths from malaria.





Annually, an estimated **160 million**

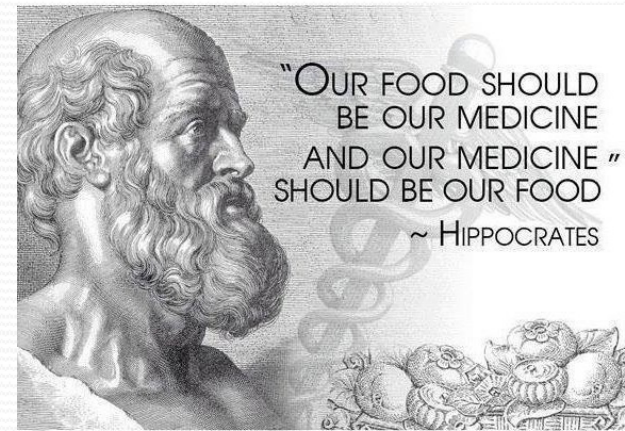
new cases of work-related diseases occur worldwide,  
including;

- Respiratory and cardiovascular diseases,
- Cancer,
- Hearing loss,
- Musculoskeletal and reproductive disorders,
- Mental and neurological illnesses.

# Historical background of occupational health

The work place is a potentially hazardous environment where millions of employees pass at least one-third of their life time. This fact has been recognized for a long time, although developed very slowly until 1900.

There has been an awareness of industrial hygiene since antiquity. The environment and its relation to worker health was recognized as early as the fourth century BC when Hippocrates noted lead toxicity in the mining industry.



**In the first century AD**, Pliny the Elder, a Roman scholar, perceived health risks to those working with zinc and sulfur. He devised a face mask made from an animal bladder to protect workers from exposure to dust and lead fumes.



**In the second century AD**, the Greek physician, Galen, accurately described the pathology of lead poisoning and also recognized the hazardous exposures of copper miners to acid mists.





**In the middle Ages**, guilds worked at assisting sick workers and their families. In 1556, the German scholar, Agricola, advanced the science of industrial hygiene even further when, in his book *De Re Metallica*, he described the diseases of miners and prescribed preventive measures. The book included suggestions for mine ventilation and worker protection, discussed mining accidents, and described diseases associated with mining occupations such as silicosis.

SCIENCE

Georgius Agricola  
**DE RE METALLICA**

Translated by  
**Herbert Clark Hoover  
and Lou Henry Hoover**

Originally published in 1556, Agricola's *De Re Metallica* was the first book on mining to be based on field research and observation—what today would be called the “scientific approach.” It was therefore the first book to offer detailed technical drawings to illustrate the various specialized techniques of the many branches of mining, and the first to provide a realistic history of mining from antiquity to the mid-sixteenth century.

For almost 200 years, Agricola remained the only authoritative work in this area and by modern times it had become one of the most highly respected scientific classics of all time. A book more often referred to in literature on mining and metallurgy than any other, its Latin text prevented it from being as widely used as it might have been.

In 1912, the book was translated by former President Herbert Clark Hoover and his wife. Printed in a limited edition, the work was quickly bought up by book collectors, historians, and medievalists, who had found that there was much to be learned from its pages. The book contains an unprecedented wealth of material on alluvial mining, alchemy, silver refining, smelting, surveying, limbing, nitric acid making, and hundreds of other phases of the medieval art of metallurgy. The text even covers the legal aspects of mining—the use of boundary stones, forfeitures of titles, safety requirements of tunnel-building in the 1500s, and so on.

But the plates, perhaps more than anything else, have insured Agricola's continued importance. Brilliantly executed drawings, richly detailed, reveal a whole medieval world of machinery, industrial technique, tools, even costume and architecture. All 289 of the original woodcuts are reproduced in this reprint of the 1912 edition, offering students of the period, commercial artists, engineers, metallurgists, and even curious general readers an unforgettable picture of the first age of technology.

Unabridged Dover (1988) republication of the 1912 edition.

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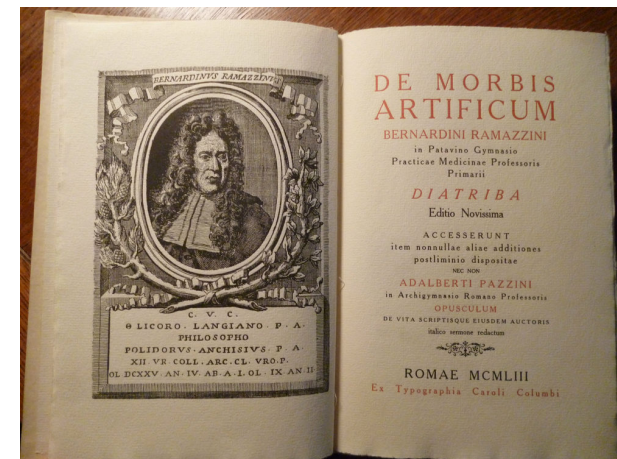
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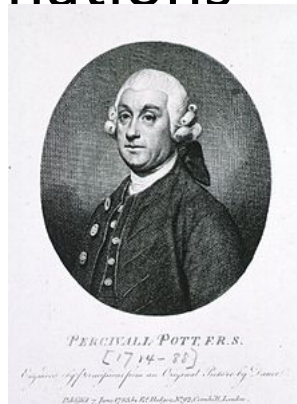


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Industrial hygiene gained further respectability in **1700** when Bernardo Ramazzini, known as the "father of industrial medicine," published in Italy the first comprehensive book on industrial medicine, *De Morbis Artificum Diatriba* (The Diseases of Workmen). The book contained accurate descriptions of the occupational diseases of most of the workers of his time. Ramazzini greatly affected the future of industrial hygiene because he asserted that occupational diseases should be studied in the work environment rather than in hospital wards.




In England in the **18th century**, Percival Pott, as a result of his findings on the insidious effects of soot on chimney sweepers, was a major force in getting the British Parliament to pass the Chimney- Sweepers Act of 1788. The passage of the English Factory Acts beginning in 1833 marked the first effective legislative acts in the field of industrial safety. The Acts, however, were intended to provide compensation for accidents rather than to control their causes. Later, various other European nations developed workers' compensation acts, which stimulated the adoption of increased factory safety precautions and the establishment of medical services within industrial plants.




In the early **20th century** in the U.S., Dr. Alice Hamilton led efforts to improve industrial hygiene. She observed industrial conditions first hand and startled mine owners, factory managers, and state officials with evidence that there was a correlation between worker illness and exposure to toxins. She also presented definitive proposals for eliminating unhealthy working conditions.





At about the same time, U.S. federal and state agencies began investigating health conditions in industry. In 1908, public awareness of occupationally related diseases stimulated the passage of compensation acts for certain civil employees. States passed the first workers' compensation laws in 1911.

And in 1913, the New York Department of Labor and the Ohio Department of Health established the first state industrial hygiene programs. All states enacted such legislation by 1948. In most states, there is some compensation coverage for workers contracting occupational diseases.



However, concrete approach to the control of occupational diseases became valid in most countries after the twentieth century. Emphasis was then given to the control of working hazards, and multidisciplinary approach to such effective measures in which at least triparty: the employer, the employee, and the competent authority are together participating in the problem solution.

Much improvement in the workers health protection has been made in developed countries in the field of industrial hygiene and safety, and occupational medicine.

There is still a long distance ahead for developing countries.

# 1. OCCUPATIONAL HEALTH



International  
Labour  
Organization



World Health  
Organization

It is the scientific and systematic researches aimed to protect workers in workplaces from the conditions resulting from various sources during working and being risk to the health.

Since 1950, the **International Labour Organization (ILO)** and the **World Health Organization (WHO)** have shared a common definition of occupational health.

## Occupational health should aim at:

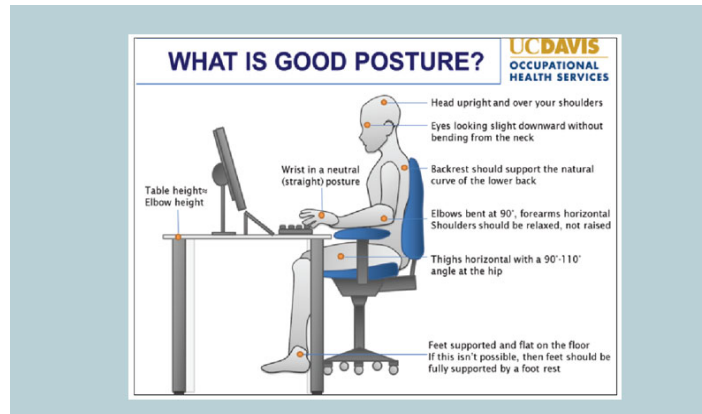
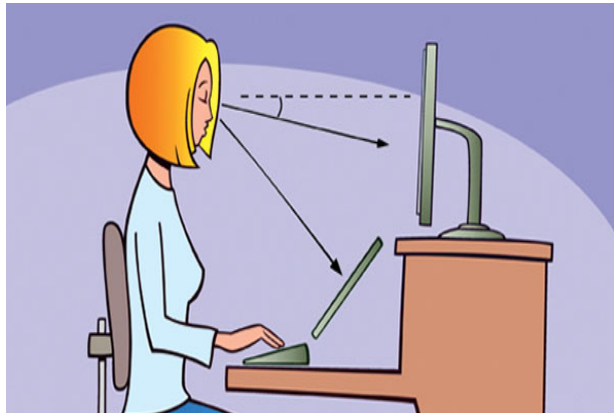
- The promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations,
- The prevention amongst workers of departures from health caused by their working conditions,
- The protection of workers in their employment from risks resulting from factors adverse to health,
- The placing and maintenance of the worker in an occupational environment adapted to his physiological and psychological capabilities.



## Ergonomics?

The systematic study of people at work with the **objective of improving the work situation, the working conditions and the tasks performed.**

The aim of ergonomics is to ensure that the working situation is in **harmony with the activities of the worker.**




# 1.1. OCCUPATIONAL HEALTH SERVICES

## A- Medical Examinations

- Pre-employment examinations
- Periodical examinations
- Other examinations

## B- Supervision of working environment



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- 1- Industrial hygiene; prevention of occupational diseases through control of risks of workers' health
  - 2- Occupational safety; prevention of accidents and supervision of personal protective equipment
  - 3- Job analysis and adaptation of the job to the workers in the light of hygienic, physiological and psychological consideration
  - 4- General sanitation
  - 5- Advise to management and workers representatives on working environment and ergonomics, prevention of accidents and occupational diseases, welfare of workers and vocational rehabilitation and training
  - 6- Health education and training; training in health, hygiene, first aid
  - 7- Compilation and periodic review of statistics concerning health conditions in undertaking, maintenance of records, preparation of reports, recording and analysis of absenteeism due to accidents and sick leave, notification of occupational diseases
  - 8- Nutrition
  - 9- Research in occupational health
  - 10- Collaboration with external services
  - 11- Medical treatment, first aid and emergency treatment, ambulatory treatment of workers who have not been absent from work or who have returned after absent, medical rehabilitation, dental care, general treatment ( vaccination), treatment of dependents(addicts)

# 1.1. OCCUPATIONAL HEALTH AND SAFETY COMMITTEE

- Employer or representative of employer
- Doctor specialized in the field of occupational health and safety (OHS)
- OHS supervisor or a technical staff charged with OHS
- Sociologist or a person dealing with personnel or social affairs
- Expert of civilian defence
- Representative of foremen, masters
- Representative of workers or worker's organizations



## 2. OCCUPATIONAL ACCIDENT

It is defined as **unexpected, unplanned occurrences** which may involve injury. (ILO)

Including acts of violence, arising out of or in connection with work which results in one or more workers incurring a personal injury, disease or death.

**Occupational accident** = Dangerous behaviour x Dangerous Situation



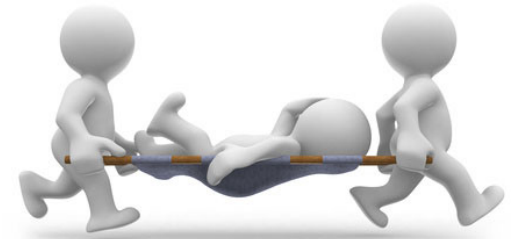
# TYPES OF ACCIDENTS

1. Handling accidents
- 2- Transport accident
- 3- Falls
- 4- Striking to objects
- 5- Struck by falling objects
- 6- Hand tools accidents
- 7- Machinery accidents
- 8- Electrical accidents
- 9- Accident by burning, fire and explosion



# RESULTS OF WORKS ACCIDENTS

- 1. Fatalities**
- 2. Permanent disablement**
- 3. Temporary disablement**
- 4. Other cases**



# Unwellness at work is incredibly costly!



**\$1,100b**

Costs of chronic disease



**\$250b**

Costs of work-related injuries & illnesses



**\$300b**

Costs of work-related stress



**\$550b**

Costs of disengagement at work

**\$2.2 trillion annual loss in the United States (12% of GDP)**



# HOW TO PREVENT ACCIDENTS?

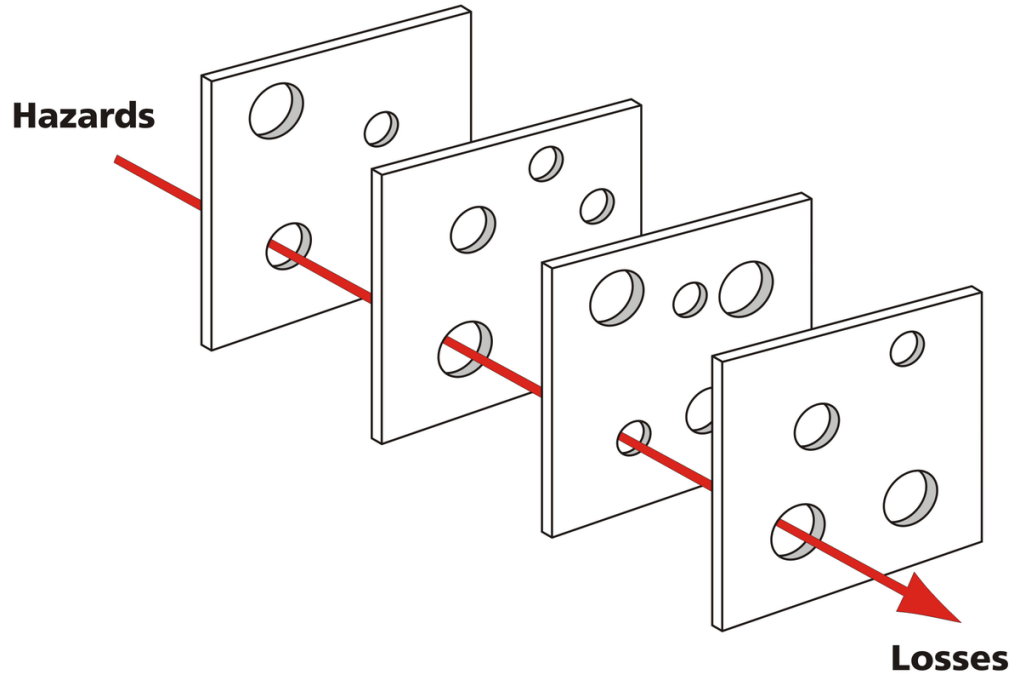




# **ACCIDENT PREVENTION**

**A- Physical measures**

**B- Safety program:**



The Swiss cheese model of accident causation illustrates that, although many layers of defense lie between hazards and accidents, there are flaws in each layer that, if aligned, can allow the accident to occur.