FILE NAME: Edison Electric Institute (EEI)

DATE: 1942 Mar

DOC#: EEI004

DOCUMENT DESCRIPTION: EEI Bulletin - Industrial Health

EDISON ELECTRIC INSTITUTE BULLETIN

MARCH, 1942

More About Blackouts: Dissimilarities of British and American Needs . . . . . ALEXANDER MAXWELL 77

Salvage and Reclamation Operations of Utilities in the War Program . . . . . H. E. HODGSON, M. B. COVELL and T. W. AYTON 79

Utilization Voltages . . . . . HOWARD P. SEELYE 83

Industrial Health . . . . . DR. C. O. SAPPINGTON 88

An Educational Program for Industrial Fire Prevention Protection . . . . . JOSEPH A. McGUCKIN 91

Walker Heads Newly Formed Council of Operating Companies 92

War-Time Developments in Electric Wiring . . . . . E. S. McCONNELL 93

Accounting Meeting to be Held in May 94

Scenes from Color Movie Tell Dramatic Story 95

Priorities on Safety Equipment: As They Concern the Electric Utilities . . . T. R. CLAFFY, J. B. DAVIES and H. B. WILSON 96

How Utilities Are Aiding Farmers to Secure Maximum Food Production 99

Final Data on 1941 Electric Operations 103

Accident Prevention Committee Meeting . . . . . GEORGE S. DIEHL 107

Winners of Water Heater Display and Home Lighting Contests 109

Personals 111

Conventions and Meetings, 112

EDISON ELECTRIC INSTITUTE

PLAINTIFF'S EXHIBIT PET-8

EEI 00031

Industrial Health

By C. O. Sappington, M.D., Dr. P.H.
Consultant, Chicago, Illinois

One of a Series of Articles Sponsored By the Accident Prevention Committee of the Edison Electric Institute

INDUSTRIAL health is a cooperative undertaking. This means that many different types and groups of people are *interested* in and concerned with it, including the employer and employee, research worker, physician, safety and industrial hygiene engineer, mentioning also the insurance company, the lawyer, director of personnel and labor relations, public relations personnel, the nurse, psychologist and psychiatrist. At the outset, it is advisable to discuss the scope of industrial health work and the *meaning of the terminology* used in connection with industrial health problems.

Industrial health is a broad term and obviously includes all methods and practices aimed at the supervision and maintenance of a high level of personal health among industrial workers. The complexity of the field is thus obvious, particularly when it is realized that any factor which may adversely affect health becomes a problem for concern and investigation. In the very beginning, it should be noted that the essence of industrial health lies in the *prevention* of trouble. This conception necessarily broadens the field of approach and application of industrial health procedures.

A distinction should be made between the general practice of industrial health and the general practice of industrial medicine and surgery. This distinction has already been made in practice in most instances. By and large, the practice of industrial medicine and surgery is limited to the diagnosis and treatment of disease and injuries. This, of course, is entirely the responsiblity of the physician and in most instances, the physician is mainly occupied with curative procedures. There is, however, what is called preventive medicine in industry. This directly applies to industrial health work, and in it the physician is used for certain procedures which will be discussed later.

Industrial hygiene engineering is an integral part of industrial health work, which is specifically concerned with certain factors in the working environment which might become health hazards under certain circumstances. Such factors include dusts, gases, vapors and fumes; temperature, humidity and air motion; the kind of illumination; type of ventilation used, both natural and artificial; the physical setup of equipment; the types of materials handled with particular reference to their becoming potential health hazards.

It is the job of the industrial hygiene engineer to use various types of instruments for the collection of dusts, gases, vapors, and fumes, and to determine the quality and quantity of these materials in the breathing atmosphere; to estimate the kind and intensity of illumination; to make measurements with reference to the efficiency of exhaust ventilation systems and natural systems; to make observations relative to temperature, humidity and air motion; and otherwise to give attention to the various factors in the environment which might bear directly on the health of workers. By comparing what the conditions are with the various standards, the industrial physician has information which can be used as the basis of recommendations for control of any hazards which may exist, and also in checking the physical reactions of employees.

It is also important to consider the possibility of accidental injuries, and therefore safety engineering becomes a very definite and important phase of industrial health. It is the duty of the safety engineer to make inspections and to point out what potential injury hazards exist with respect to the running of machines, the handling of materials, and various other methods and practices in industry which have to be observed and analyzed for the possibility of injury hazards.

Another important phase of industrial health is sanitation and housekeeping. Within this category come the importance of keeping the workplace clean and orderly throughout the working period, and the provison of proper sanitary facilities, such as shower baths, washrooms, toilets, and the like.

THE FOUR-POINT PROGRAM

Now let us consider a sample survey in a relatively small plant of approximately 175 employees, including in this survey the following four different types of observations:

I. Safety Engineering Control
II. Industrial Hygiene Engineering Control
III. Sanitation and Housekeeping
IV. Health Control

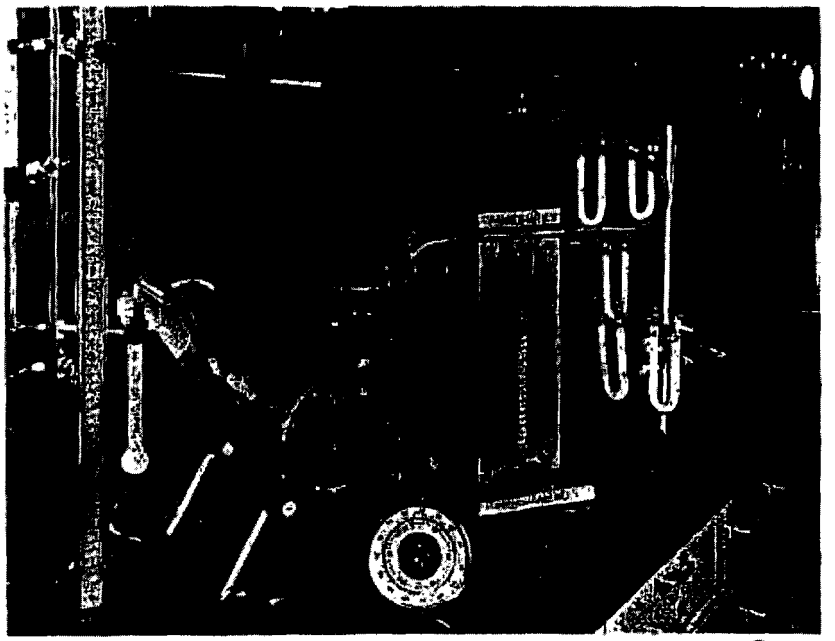
Safety Engineering Control—During the safety inspection, it was discovered that there were a number of unsafe practices, such as the use of abrasive wheels without protection for the eyes; material being so placed that it constituted a slipping and tripping hazard; the use of punch presses without proper guards; and the unsafe use of a freight elevator. In addition to specific suggestions in each instance regarding unsafe practices, the following recommendations were made:

1. First aid dispensary adequately supplied and run.
2. Analysis of accident experience during the past ten years followed by specific recommendations.
3. The appointment of a plant safety committee.
4. Periodic inspections and investigations of accidents by safety committee, physician and nurse.

Industrial Hygiene Engineering Control—The industrial hygiene inspection showed among other things, a deficiency in the proper type of lighting; lack of providing proper temperatures, humidity and air motion; occurrence of various types of dusts and vapors in the air, and in various departments, the handling of materials known to have caused skin irritation. The following specific recommendations were made:

1. Measurements of lighting in various departments, with the establishment of proper standards.
2. The measurements of temperature, humidity, and air motion in various departments, and the establishment of proper physical conditions of atmosphere.
3. Measurements of vapor concentrations and dust concentrations, with remedying of conditions as found necessary.

EEI 00032



Portable apparatus for determining concentrations of various vapors and gases in industrial atmospheres. Left: Interferometer. Right: Silica gel adsorption tubes connected to flowmeter and motor pump suction apparatus. Lower Center: Aneroid barometer.

4. Provision for the use of rubber gloves in various departments where the materials handled are capable of producing skin irritation.

Sanitation and Housekeeping—Observations with respect to sanitation and housekeeping showed that aisles and walkways were very often blocked; refuse disposal program inefficient; floors, toilets and washbowls in dirty condition; employees eating at work benches or in workrooms; and dirty and obsolete drinking fountains.

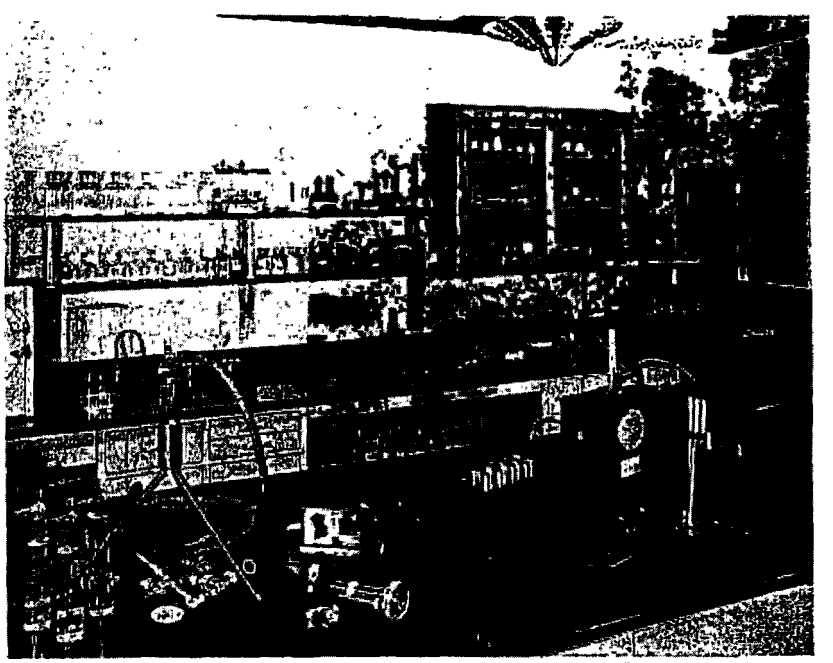
Specific recommendations were made in each instance with respect to the control of sanitation and housekeeping conditions.

Health Control—With respect to the health control program, the following recommendations were made:

1. Obligatory physical examinations of all new employees. (Using adequate forms and standards of acceptance related to the actual industrial exposures in the working environment.)
2. Voluntary physical examinations of employed persons on a privilege basis, with employer's guarantee of no discriminatory measures.
3. Compulsory periodic examinations (as found expedient) on all those employees exposed to health hazards, as determined by industrial hygiene engineering studies.
4. Follow-up procedures on all examinations when needed, for special advice concerning correction of physical defects, cooperation with family physician, and other similar measures.
5. Simple but complete system for the recording of examination data, first aid calls, absenteeism records, accidents and illnesses.
6. Provision for full time registered nurse in charge of simply equipped dispensary for first aid to accidents and illnesses, and the keeping of records.
7. Provision for part time industrial physician with prearranged hours at plant dispensary, for consultations, examinations, and plant inspections.
8. Health education program for employees, carried on through the physician and nurse, and also through a plant health committee.

ADAPTATION OF THE PROGRAM

In the adaptation of the foregoing program to the use of public utility organizations, it is realized that there may not be the necessity for carrying out all the procedures as indicated; this statement applies particularly to some of the industrial hygiene engineering methods with reference to the determination of air contamination by various dusts, vapors, gases and fumes. It should be said,

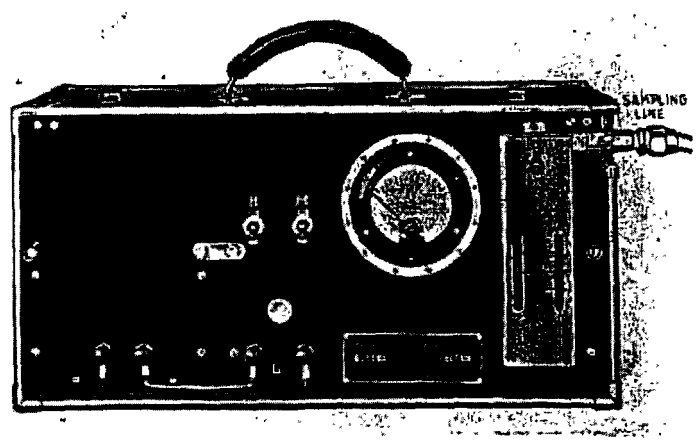


Portable apparatus for determining concentrations of dusts and fumes in industrial atmospheres. Left: Standard size impinger tubes with connection to ejector suction device for continuous sampling of dust. Center: Konimeter, especially for study of "grab" samples of dust in low range concentrations. Right: Electric precipitator for continuous sampling of dusts or fumes.

however, so that there will not be any misunderstanding, that in organizations where illuminating gas is manufactured, there will be need for the use of some of these industrial hygiene technical methods—there also may be other instances.

From information derived about 18 years ago while doing a statistical study of accidents and illnesses in a large Boston public utility, the author is aware of the fact that there is a wide range of occupations in the larger public utility groups and hence the necessity for the application of a wide range of a hygiene and health program. On the other hand, in the smaller groups, of which there are many, the four point program as given can be especially adapted to the smaller organizations with a great deal of practical benefit, both to employees and the employer. The author has had personal experience with this plan in a group of small plants having from 12 to 350 employees—the plan works. It is particularly with this point in mind that the present article was written, so that the officials in small groups could see just what kind of program of health activities could be especially arranged for their organizations.

Sometimes the plant engineer or the works superintendent is the man who would probably have charge of such a program, or at least stimulate interest enough in it, so that other professional persons might be engaged, probably on a part time basis. As an aid to any plant engineer, official, physician or nurse who may be interested, and as a starting point for this type of service, the author has devised a check list from which can be made a record of materials and supplies, processes and operations, and the methods and conditions under which work is performed. This check list will serve, as indicated, as a starting point in the study of potential, actual or legal health hazards. The interested reader may secure a copy through the Edison Electric Institute *Bulletin*, or the author.



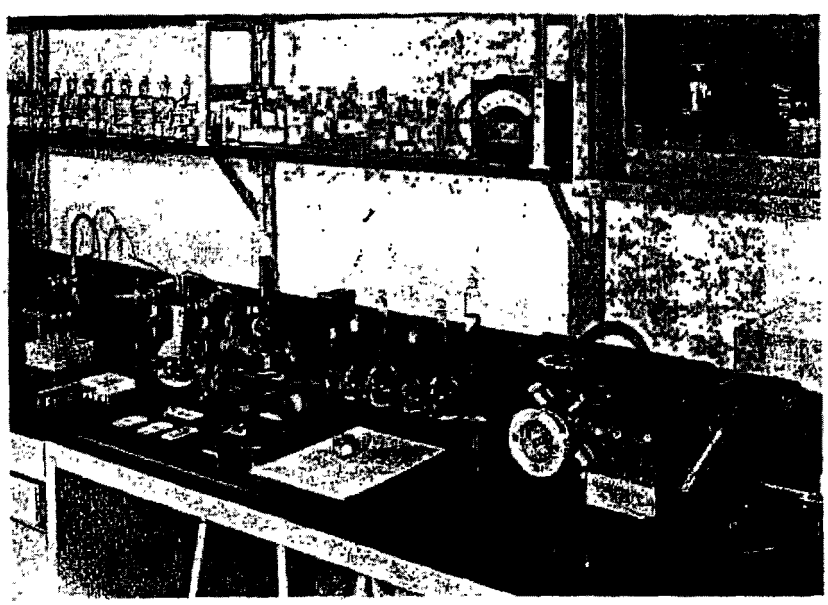
Portable continuous carbon monoxide indicator for sampling mine and factory atmospheres.

DEFENSE ACTIVITIES

This article would not be complete without some brief mention of defense activities. It is quite likely that the public utilities of the United States will be more and more called upon for increased production. This may mean increase in working hours, or certain stresses and tensions consequent upon the pressure produced by the emergency. There has been a great deal of speculation concerning the effects of the so-called "speed up" on exposed employees. Experience during the year 1941 and up to the present time has indicated that the "speed up" alone is not responsible for the untoward reactions experienced by employees—the real reason is lack of proper supervision. By proper supervision is meant the quality of supervision which should be given and also the amount of supervision which should be given. Such supervision may be technical, either just before employment or while "breaking in" or after a considerable time of employment; it may be medical, health and safety supervision; or it may be personnel supervision, involving the social and psychological problems of the employees. The great difficulty seems to have been to get trained and experienced supervisors of the above types so that the employee can be properly supervised. The lack of trained personnel has resulted in the necessity for most supervisors being responsible for two to ten times as many persons as under ordinary conditions of employment. Under emergency conditions it can readily be seen that both accidents and ill health might easily increase in frequency and severity, such as actually has been the case during the year 1941.

The solution of this problem is obviously the training of more supervisors and the use of more of them. It is not within the province of this article to go into this subject, but it mentioned as a

(Continued on page 98)



Laboratory and portable equipment for dust determinations in industrial atmospheres. Left and Center: Midget impinger tubes, pipette, counting cells, microscope, counter, and dilution flasks.

EEI 00034