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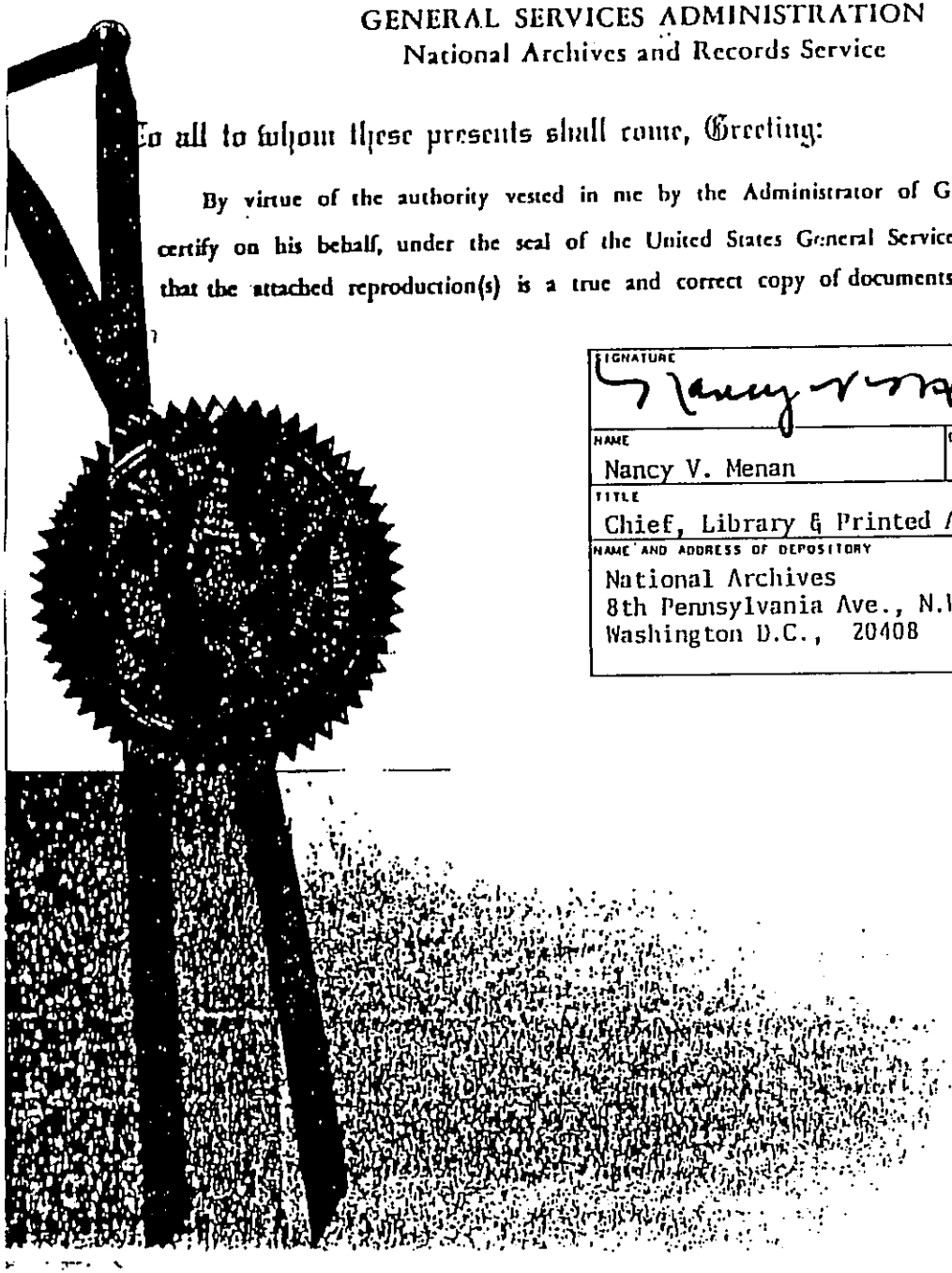
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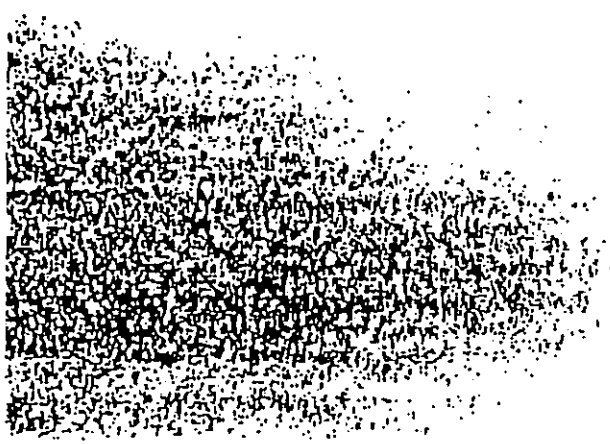
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Annual Report of the Surgeon General, U.S. Navy, Chief of the Bureau of Medicine and Surgery, to the Secretary of...
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UNITED STATES NAVY DEPARTMENT
BUREAU OF MEDICINE AND SURGERY

ANNUAL REPORT OF THE SURGEON GENERAL, U. S. NAVY

CHIEF OF THE BUREAU OF MEDICINE AND SURGERY

TO THE SECRETARY OF THE NAVY

CONCERNING

STATISTICS OF DISEASES AND INJURIES IN THE UNITED STATES NAVY

FOR THE CALENDAR YEAR

1939

UNITED STATES
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WASHINGTON : 1941

der consideration. Metallic lead is handled in the molten state as a component of Babbitt metal in the Inside Machine Shop (No. 31). This metal contains lead, antimony, and copper. The lead volatilizes at a relatively low temperature. The melting kettles are equipped with a hood connected to an air exhaust system with suitable suction fan pipe and conduit to remove fumes which form on the surface of the molten metal. In addition, a respirator is provided for protection against the inhalation of fumes.

Lacquer painting with spray technique is conducted with lacquers made up of a celluloid base with certain volatile solvents, some fast and some slow drying, which may lead to toxic symptoms if inhaled beyond threshold concentrations.

The Ordnance Machine Shop, Electrical Shop, and Sheet Metal Shop are equipped with hoods connected to adequate exhaust systems. In the Ordnance Machine and Sheet Metal Shops a water spray curtain is also provided for more effective removal of fumes. The spray room of the paint shop is not equipped with a hood, dependence being placed upon an exhaust blower for removal of fumes. This lack of localized exhaust results in a much slower rate of removal of contaminated air. No cases of volatile solvent poisoning were reported during the calendar year.

It is recommended that all spray painters be given an annual examination for evidence of toxic effects of volatile solvents.

Industrial Protection Against X-ray and Radium: (a) X-ray protection.--The Pipefitter Shop is equipped with one portable X-ray machine of 220 kilovolts and 25 milliamperes capacity which was installed approximately two years ago. This is employed chiefly for the detection of flaws in pipe-welded joints for high steam pressure installation. The maximum number of exposures approximates a total of 51 minutes a day. (1) Engineering Control: The X-ray tube is encased in lead of 2mm. thickness. The machine is contained in an enclosure 20 feet by 20 feet bounded by a shield 6-1/2 feet high, 10 feet from the tube in all directions and lined with sheet lead 2mm. thickness on three sides. (2) Medical Control: Four men are assigned as operators of the X-ray and radium installations. One of the earliest effects of radiation exposure is a destructive action on the white and red cells of the blood, more marked on the white cells in the early stages. A procedure has been established for a quarterly blood examination of operating personnel and an examination for possible general radiation injury.

(b) Radium Protection.--The use of radium was initiated 4 to 5 years ago for the detection of flaws in castings constructed for high pressure steam installations, both steel and non-ferrous. A capsule containing 278 mgms. of radium is the source of the radiation, the tests being conducted in the Inside Machine Shop. This is in use for an average of 150 to 200 hours a month. The chief metallurgist reports that high speed films exposed at a distance of 12 feet from the capsule for one hour showed no fogging. It is therefore concluded that employees are not subject to harmful radiation at that distance. Protective measures appear adequate.

It is emphasized that a thorough physical examination of a radium or X-ray worker shall be made before he is employed and at any time that the blood count shows suggestive changes or the worker complains of an obscure ailment. The question arises whether the foregoing measures of protection against X-ray radiation are entirely adequate. The situation was recently discussed with the Chairman of the Advisory Committee on X-ray Protection of the Bureau of Standards. He suggested that personnel within the distance of 40 feet external of the lead [illegible] While the casual

workers would probably not receive a damaging exposure, the question of such a possibility demands consideration. The absolute necessity for further protection can be definitely determined by actual measurements of scattered radiation by means of the portable ionization chamber. It is recommended that the advisability of such tests be considered.

Precautions Relative to Pickling of Metals: (a) Building Ways, No. 1.--There are two sets of pickling tanks in this area one for flat steel and one for piping. The acid employed is dilute sulphuric. The question at issue is whether at any stage of operation personnel are subjected to the inhalation of arsine gas or arsenic dust originating as a result of contact with arsenic, present as an impurity of the metal, with nascent hydrogen in the bath. Such a possibility appears extremely remote in view of the fact that the operations are conducted in the open air thus excluding the possibility of rising accumulation of arsenical compounds which might result in an enclosed space. However, it is advisable that the operating personnel be examined semi-annually for possible evidence of arsenic absorption instead of the quarterly examination now prescribed.

(b) Coppersmith Shop.--Both sulphuric and muriatic acids are used in the vats of this enclosed space connected with the coppersmith shop. The possibility of arsenical exposure discussed above also obtains for this space. Forced exhaust ventilation is provided and appears adequate. A semi-annual medical examination of operating personnel is advisable.

Occupational Dust Hazards: (a) The Steel and Brass Foundries.--The chief hazard to be considered is silicosis due to the inhalation of silica dust, the extent of the hazard being dependent upon the concentration, size of the particles, percentage of free silica, and the duration of exposure. Whether or not a silicosis hazard exists in these foundries can only be determined by actual counts of dust particles concentration under the various working conditions and the estimation of free silica in the sand used. It has recently been reported by the New York State Department of Labor that silicosis can be prevented if the average plant concentration does not exceed 15 million parts per cubic foot.

(b) Casting Cleaning Shop.--The conditions in this shop appear to be particularly unfavorable. The iron and brass foundry buildings are equipped with forced exhaust ventilation although its efficiency in controlling dust concentrations is undetermined. The casting cleaning shop, however, is not provided with any mechanical ventilation, dependence being placed mainly on roof cowls, which, it is believed, are inadequate.

Certain of the grinding and chipping operations should be conducted under hoods with localized suction ventilation. Two high-speed emery wheels and two carborundum grinding wheels are not equipped with suction ventilation. It is recommended that consideration be given to a systematic engineering survey of both foundries and the casting cleaning shop to include dust counts and the measures necessary to reduce silicosis hazards.

There are 33 employees in the iron foundry, 64 in the brass foundry, and 22 in the casting cleaning shop. It would be desirable to carry out a medical survey, including X-ray of the lungs, of all personnel in order to determine the incidence of silicosis. For the present, however, it is suggested that such a study be limited to employees in the casting cleaning shop where the worst conditions prevail.

[illegible] candidates for employment for [illegible] operations should be given a preliminary examination of the lungs in order to screen out cases in-

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any state of silicosis.

(c) Sandblasters.--The present practice of an annual X-ray examination of the chest, or oftener if so indicated, will be continued.

(d) Hazard of Buffing and Polishing.--The possible hazard incident to dust from artificial abrasives such as carborundum, alundum, and emery should be considered. The dust from these materials does not contain free silica and therefore will not produce silicosis. However, if breathed for protracted periods, these dusts induce an X-ray appearance similar to that of early silicosis. This picture changes very slightly as length of exposure increases. There is clinical evidence, however, that workers exposed to heavy concentrations of abrasive dust are more susceptible to diseases of the chest than those not so exposed. Authorities in this field advise that an effort should be made to keep the dust count below 20 million particles per cubic foot. The dust is approximately 50 percent abrasive and 50 percent metallic. Although respirators are provided for individual use, it is impracticable to wear such a device constantly.

The buffing and polishing wheels in the Sheet Metal Shop are not equipped with localized exhaust. This is recommended as a safety precaution.

The grinding wheels in the tool room of the Shipfitter Shop are provided with either individual exhaust or are kept constantly wet which reduces to a marked degree the quantity of escaping dust.

Hazard of Asbestosis: Asbestosis is an industrial disease of the lungs incident to the inhalation of asbestos dust for prolonged periods, and is distinct from silicosis. The development of the disease depends upon the concentration of the dust, the size of the dust particles, and the length of exposure. The workers in the Pipe Covering and Insulating Shop are exposed to the inhalation of asbestos dust incident to the cutting of asbestos insulating felt in the fabrication of covers for flanges, valve bonnets, and high temperature steam turbines. The material falls under the trade name of "Amosite."

A medical survey of the 11 employees in this Shop was conducted recently with the object of ascertaining whether asbestosis in any stage could be detected. The history of exposure varied from 1.7 to 17 years, 6 men reporting 10 years or over. Present and past disability attributable to asbestosis was denied by all the men and X-rays of the chest were essentially negative in all cases. However, it was not considered that the negative findings precluded the future development of asbestosis by continued exposure to present occupational conditions. The following recommendation made jointly by the medical officer of the Yard and the safety engineer was approved: Install an exhaust blower over work table in the Pipe Covering and Insulating Shop to remove asbestos dust at the source as a protective measure against the hazard of asbestosis.

Norfolk Navy Yard, Portsmouth, Va.--Considerable work has been accomplished in industrial medicine. The medical officer, safety engineer, and W. P. A. Safety Supervisor work in close consultation. In this manner the medical and technical aspects of each industrial problem is properly coordinated. The Bureau of Medicine and Surgery and the Navy Department Safety Engineer have been consulted on several occasions and have given valuable suggestions.

A special effort has been made to collect literature and data with regard to industrial medicine to be used for reference purposes. Special attention is given to the working conditions in hazardous occupations such as sand-blasting, asbestos pipe-covering, amosite and fiberglass insulation. Ventilation, clothing, masks, etc. are checked frequently. Sand-blasting are of various types. A special study is being attempted with regard to types of masks, helmets, and respirators with the idea of recommending standard items of as near one type as possible.

An extensive study of a new insulating material, fiber-glass, now employed by the Navy, has recently been carried out by this department. Representatives of the manufacturers of this product have been interviewed, and numerous reports of clinical and laboratory investigations have been reviewed. The representatives claim that no harmful effects from the material have been noted among their employees over a period of 8 years, and the only precautions used are loose clothing and a good cleansing shower at the end of each working day. The evidence submitted is not entirely convincing, and the period of time since the introduction of the product is too short to warrant any definite conclusions at present. Until further information is available the following precautions are in effect: The employee must wear hood, respirator, and gloves at all times; the clothing must be loose and cover the arms and neck; goggles must be worn if there is excessive circulation in the compartment; and showers are required before lunch and at the close of the day.

At present the Norfolk Navy Yard has no instruments for making dust counts. The acquisition of at least one of the new and recently improved instruments would be a great advancement in the field of industrial medicine at this Navy Yard and would afford an opportunity for considerable research.

The hazards to civil employees consequent to industrial activity is a problem and requires continued, intense, effort and research with regard to personnel, new materials, new machinery, and new processes. Safety devices and rules should maintain a high standard. This aspect should be studied, developed, and mastered. It requires cooperation in safety engineering and intensive study of industrial health problems.

Naval Torpedo Station, Newport, R. I.--The number of infections following injuries remains low among civil employees at this station. This is due no doubt to the cooperation of all concerned in routing injuries, no matter how trivial, to the dispensary, where they are promptly treated. A follow-up system is also used whereby cases must report for daily observation and redressings until discharged. Many cases of colds, grippe, and bronchitis have developed among the civilian employees during the fall and winter months. By treating these cases three times daily with antiseptic sprays, cough mixtures, and cold capsules, and the prompt checking out of cases with elevated temperatures, an appreciable decline in lost-time incidence has been noted. It is encouraging to note that accidents are on the decline in spite of the increase in employees. By comparative classification we find that in 1935 there were about 4,963 injuries among 2,403 employees and in 1939 about 3,500 injuries among 3,852 employees.

A general physical examination of all workers in explosive materials, including a complete blood analysis and urinalysis, has been done monthly since October, 1939. An effort is being made to prevent occupational poisonings, with particular reference to tetryl and fulminate of mercury. To date no statistical data have been completed. Sand-blasters are examined routinely each month, and routine chest X-rays are done every three months, oftener if thought necessary.

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