

# An Industrial Hygiene Project in India

By HARRY HEIMANN, M.D.

INDIA, the eighth largest industrial country of the world, is in the process of rapidly expanding its economy. In this economic expansion, industrial operations play an important part. The Government of India, recognizing the importance of the welfare and health of the workers in maintaining a high level of production, has taken many forward-looking steps to preserve these valuable assets. One of these steps has been the promulgation of laws relative to the prevention of occupational diseases. In fact, India has a workmen's compensation law, in effect since 1923, which recognizes 12 occupational diseases as compensable, and another law, enacted in 1948, which makes notification of the occurrence of 17 occupational diseases compulsory. Claims for compensation for occupational diseases have rarely been made, however, and the reporting of such diseases to appropriate authorities has been even rarer.

The Indian officials concerned have for some years recognized that conditions of work in industry in their country must be a cause of much more illness than the official records indi-

cate, and they have recognized the failure to receive reports of occupational diseases as a defect in their program. They knew that only when they would have information about where and under what conditions these diseases occurred would they be able to take the necessary steps to eliminate them.

Consequently, the Government of India requested that a team of industrial hygiene experts from the United States be sent to India to advise and assist in evaluating its occupational disease problems, with the ultimate purpose of improving the country's industrial production through the conservation of the health of the labor force. More specifically, the request was for a team consisting of an industrial hygiene engineer, an industrial hygiene chemist, and an industrial hygiene physician to demonstrate by precept and by example how occupational disease problems might be evaluated in India.

## Team Personnel and Equipment

In November 1951, a United States Technical Cooperation Administration team consisting of an engineer, a chemist, and a physician arrived in India to stay for 6 months. At the end of 6 months, only the physician remained, but at the request of the Government of India, the project was extended for another 12-month period. A chemical engineer joined the physician in October 1952 for the last months of the project.

The Government of India, in its original prospectus for the work to be done by the team,

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emphasized the fact that the specialized instruments which they would need were not then available in India. Therefore, engineering instruments for collecting air samples and for making field tests of conditions in factories were ordered before the team left the United States. Equipment for medical examinations was not ordered until much later, and it did not arrive until shortly before the project terminated.

### **Indian Technical Staff**

The United States team was assigned to the Office of the Chief Adviser Factories of the Ministry of Labor in New Delhi. In addition to giving advice on occupational disease control, through some 18 State factory inspectorates, the Office of the Chief Adviser Factories has among its activities the following: industrial safety, industrial building construction, certain industrial welfare programs, and dock safety. The first three functions are carried out, primarily, by advisory work to the States, most of which have their own factory inspection units for the day-to-day work. Dock safety work is done directly by this office through its technicians in the important ports of Bombay, Calcutta, and Madras. Thus, the personnel of the Office of the Chief Adviser Factories are occupied with many official duties.

In addition to the director, who was well qualified in industrial safety, a physician, three engineers, and a chemist, all of whom had an adequate grounding in the fundamentals of occupational disease control, were the technical staff of this office. This was the primary group with whom the industrial hygiene team was to work and with whom it was to leave in India a further knowledge of the specialty. As contact was made with technical persons on the State government staffs, industrial engineers, and medical personnel, it was expected that to them as well would be transmitted a better understanding of local occupational disease problems and how they might be solved.

### **Preliminary Survey**

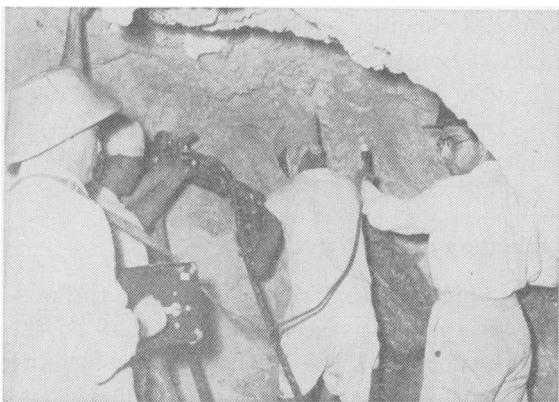
Immediately upon arrival in India, the United States team began its preliminary ob-

servations, the purpose of which was essentially twofold: (a) to obtain information on the nature of Indian industries and working conditions in them to determine to what degree, if any, they differ from those in other countries; and (b) to evaluate the degree of understanding of the occupational disease problems among appropriate Indian nationals. After preliminary conferences and discussions with the personnel of the Office of the Chief Adviser Factories and other officials of the Ministry of Labor, the team visited Bombay, Ahmadabad, Calcutta, and Jamshedpur, in which all types of industry are highly concentrated. Later in the project, the team also visited industrial establishments in Delhi, Mysore, Bangalore, Kolar Gold Fields, Giridih, and Kodarma.

In each of these communities, the team and representatives of the Office of the Chief Adviser Factories held conferences with the State chief inspectors of factories and their staffs and made inspections of factories representative of local industry. In all, some 80 to 100 industrial operations were visited, including chemical plants, automobile assembly plants, foundries (ferrous and nonferrous), ceramics factories, glass factories, paint factories, steel plants, airplane repair plants, storage battery factories, dry-cell battery factories, rubber tire factories, manganese mines, iron ore mines, metal machining operations, clothing factories, leather tanning factories, cloth weaving sheds, and jute factories. In each, pertinent recommendations were made to factory management, as necessary for the evaluation and control of occupational disease hazards. As items regarding occupational diseases were observed, they were pointed out to the Indian Government officials and others who accompanied the team on these tours.

### **Broad Study Program**

Following the preliminary observation period, a program of actual field surveys was prepared. These surveys were to be undertaken to determine the size of the occupational disease problem in India and how it might be combated. It appeared to the team that, in the present stage of industrial development of the country, the largest single group of occupa-



**Collecting a sample of airborne dust while workers operate a mechanical drill in a mica mine.**

tional disease hazards was the industrially created dusts which tend to produce adverse health effects on the lungs alone. Therefore, the program stressed the need for surveying the industries that have been known to produce such diseases elsewhere, such as the cotton textile industry, the jute industry, mining, and the asbestos industry.

#### **Planned Studies**

Most of the planned studies were done in three field surveys of occupational disease. These included studies of the health hazards in refractory brick making and chromite mining and processing and a study of the silica dust hazard in mica mining and processing.

The United States team planned the study of the health hazards in refractory brick making, made the initial survey, prepared the prospectus for the investigation, indicated where and how the environmental dust studies should be made, and, finally, read all the chest X-ray films. The data will be analyzed and a written report prepared by the Ministry of Labor technicians, on the basis of the pattern the team established and the report will be published by the Government of India.

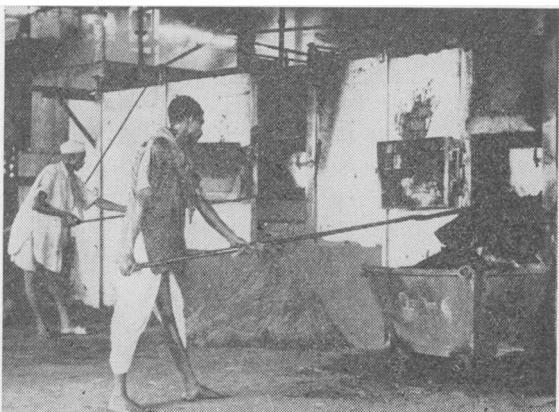
For the chromite mining and mica mining studies, the team prepared the prospectuses, participated in the preliminary surveys, participated in and supervised the collection of the engineering and medical data, and prepared the final reports. The report of the survey made in the mica mines of Bihar State shows

the chemical nature of the airborne dust and the degree of dustiness, the nature and degree of pulmonary disease caused by that dust, the incidence of chronic pulmonary disease among the exposed workers, and the relative degree of effectiveness of dust control measures used in some of the mines, and it makes recommendations for further improvement of the existing controls. This comprehensive survey and report probably were the first of this type to have been made in India.

#### **Collateral Work**

As time permitted, the United States team participated in other activities to help the Indian technicians increase their understanding of occupational disease. Upon their arrival in India, the team found that the Office of the Chief Adviser Factories had made two studies of occupational disease, one in the chromate manufacturing industry and the other in the lead storage battery industry, and had collected data which needed to be analyzed for possible significance. A minor objective of the studies was the demonstration of the degree to which the Indian technicians might need guidance. The team reviewed the material and, after lengthy conferences and discussions with appropriate technicians, helped to analyse the data and prepare suitable reports. These reports will be published by the Government of India.

A second activity in which the team participated was the preparation of a brochure to



**Furnace operation in a chromate-producing factory.**

stimulate reporting of occupational diseases, and to assist all concerned—medical personnel in particular, but also factory inspectors, labor welfare officers, personnel managers, safety officers, and others—in recognizing these diseases and to instruct them in the methods of prevention. This 80-page booklet was printed by the Government of India for very wide distribution.

A third team activity was the demonstration of certain laboratory methods and the proper use of industrial hygiene field and laboratory testing equipment. Methods for performing dust counts and for collecting air samples were demonstrated to industrial hygienists. Chest X-ray reading for pulmonary dust effects was demonstrated not only to the Government technicians but also to all medical personnel who manifested an interest in this subject.

In addition, some 40 lectures were given on various phases of the occupational disease problem to physicians, engineers, State factory inspectors, and others concerned with the health and welfare of the labor force. It is estimated that about 1,000 technical persons were in attendance at these lectures. Lectures were given to students in the courses in industrial hygiene at the All India Institute of Hygiene and Public Health in Calcutta, and to a large group of State junior factory inspectors. Lectures also were given at the Southeast Asian

Regional Seminar on Labor Inspection, held under the auspices of the International Labor Office in Calcutta. Attending this seminar were representatives of all the Southeast Asian countries, as well as representatives of India.

#### Evaluation of the Project

It is believed that the objective of the mission to India was accomplished, that is, the demonstration of the method of performing field surveys of occupational disease under conditions that exist in India; but it is recognized that more work needs to be done in the country for the control of those diseases. A beginning was made in making people realize that there are occupational diseases in India and that they can be controlled and prevented. It is felt, however, that more work also should be done in alerting the people to occupational disease problems.

Partly as a result of the work of the industrial hygiene team, further training in industrial disease control is being planned by the Government of India for selected government technicians. One chemist and one engineer have each spent 6 months in the United States gaining experience in industrial hygiene. It is expected that a qualified physician will soon be sent to the United States for training in industrial pulmonary dust diseases.

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### Premarital Examination Laws Compiled

A compilation of the laws now in effect in the United States and its Territories requiring premarital blood tests and physical examinations for venereal disease will be included in the publication Premarital Health Examination Legislation scheduled for release by the Public Health Service in August. The laws have been reproduced from the various legal sources of the States and Territories. Citations to these sources are given for each law.

A limited number of free copies will be available upon request to the Chief, Venereal Disease Program, Division of Special Health Services, Public Health Service, Washington 25, D. C.