A Forward Stride in Occupational Health

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IF MAN and his environment are to be comprehended as an entity, rather than as separate and conflicting systems, those who are expert in the study of man and those who are expert in the study of environment must work in close association. Perhaps nowhere is this more essential than in the field of occupational health, which is such an important component of environmental health.

The question is sometimes asked: "Why, when provision has been made for intensive study of the health aspects of air, water, food, and radiation, is it necessary to set up another study category—occupational health—which to some extent involves all these other areas?"

The answer is, of course, that man doesn't organize his various activities within the neat classifications of the physical scientist. Work is as characteristic of man as flight of a bird. Man clusters around his occupations in definable groups set in definable environments. Within these groupings, he encounters special stresses, performs special activities, and develops special interactions. Far from merely duplicating studies of air, water, food, and radiation, occupational health cuts a revealing cross section which is not merely valuable but essential for comprehension in depth of the natural interactions between the basic environmental factors. That such interactions pre-exist, and have strong needs and claims of their own for separate investigation, is fortunate indeed.

Occupational health is concerned with that part of the individual's total health which is closely associated with his employment.

But the development of occupational health as an entity is dictated by many factors. Employment presents special environmental influences and risks. The worker's life revolves around the central focus of his work. Employment creates groups of people whose health can be observed over specific periods of time. Health enters importantly into employer-employee relationships, and the products of industry in turn affect wide segments of the general population.

Furthermore, it is becoming increasingly difficult to disassociate occupational health from environmental health. Workers spend some 40 hours a week on the job as compared with 128 hours off it. Not only have the health effects of the off-duty environment increased over the decades as the hours of the workweek have diminished; in today's world, off-duty health risks are sometimes greater for workers than on-duty risks.

One of the first groups in this country to undertake research in the field of occupational health was, logically enough, the Public Health Service. Its first studies were made in 1910 in the mining and steel industries. These were followed by investigations of unsanitary conditions and high tuberculosis rates among garment workers.

In 1914, the Service established, in Washington, a special health activity for the prevention and control of disease of occupational origin. It was called the Office of Industrial Hygiene

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and Sanitation, and, growing with the nation's growth, it was the predecessor of the present Division of Occupational Health.

The division, whose headquarters and State Services Branch are in Washington, operates the Occupational Health Research and Training Facility and a field station in Salt Lake City. It conducts direct research, sponsors research by others through extramural grants, and fosters professional education in its field through its training program. It plays a vital supportive role to State agencies, industry, labor, and other groups concerned with occupational health.

Early successes in occupational health were attained by attacking the major killing and crippling diseases resulting from work conditions—poisoning (lead, mercury, phosphorus), tar cancer, silicotuberculosis, and other conditions that now, happily, no longer dominate the scene. When such cases do occur today, the cause is seldom lack of knowledge but rather lack of application of knowledge.

With the big timber cleared away, an equally dangerous undergrowth of health threats stood revealed: chronic disease, functional impairment, psychological maladjustment, disease predisposition. Concurrently, new industrial processes, new materials, and new uses moved new health problems up to fill the places vacated by the old. Conventional diagnostic and remedial skills had to be retained and applied to the new threats, but at the same time new skills had to be developed to cope with situations and problems still unresolved.

We have turned our attention now to those occupational disturbances—both of long standing and newly developing—which, by their very subtlety, take long-term tolls of the health and productivity of a large proportion of employees. The importance of the mission of our expanded and remodeled Occupational Health Research and Training Facility is illuminated by one statistic: some 400,000 cases of occupational disease still occur in this country annually.

Studies by the Occupational Health Research and Training Facility have ranged from examination of risks in animal feedmills to those of hazardous exposures in mines, the latter in cooperation with the U.S. Bureau of Mines. Animals have been studied to determine how injurious substances work in the body and how the body responds to them. Genetic factors have been studied to find out why some persons in a plant become ill and others do not.

One interesting study was undertaken following outbreaks of skin disease among celery harvesters. Extensive clinical and laboratory tests proved that it was caused by a phototoxic reaction to celery infected with "pink-rot" fungus. Exposure of workers to pink-rot celery juice and sunlight caused the dermatitis. Preventive measures recommended by the facility included the use of gloves and other protective clothing and the application of creams to serve as sunscreens.

The facility reduced widespread fear in the garment industry some years ago. Simultaneously in Arizona, Pennsylvania, and New Jersey, workers began to develop serious irritations of ear, nose, and throat. They became unduly alarmed. The facility, through expert analysis, determined that the toxic agent was a formaldehyde component in certain resins used in wash-and-wear clothing which tended, in storage warehouses, to volatilize. Preventive measures were devised. At the time this was no easy problem, but now that the answer is known our experts are able to prescribe by telephone the proper remedy: better ventilation.

The Occupational Health Research and Training Facility now employs 118 persons, of whom 52 are in the professional category, with 12 disciplines represented. Several staff members hold honorary positions on the faculty of the University of Cincinnati.

The double name of this facility's Research and Technical Services Branch is significant, for through its technical services the facility makes the all-important application of the results of its research.

Continuous studies are going forward here on how men's jobs affect their health. They are attacked cooperatively, with each team member playing his part. Our research teams are perhaps best described by listing the branch's sections: toxicology, occupational medicine, dermatology, engineering, physical and chemical analysis, and physiology.

In addition to dealing with untoward effects as they occur, the branch attempts to recognize

potential problems before workers become seriously affected, and to anticipate problems likely to arise in industries of the future. And high priority is given to analytical studies to devise ever more sensitive methods for detecting and measuring chemical and physical components of the work environment.

Studies of industrial noise here, going beyond investigation of occupational deafness, have moved into the area of noise reduction for the purpose of diminishing tensions, improving safety, and increasing worker efficiency. The facility is cooperating with the Federal Aviation Agency in a study of the health needs of airport employees, including the dangers of contagion and of exposure to fuels and solvents, and the growing problems of noise in this age of jets. In most of these noise studies, the new acoustics laboratory will play an increasingly important part.

New knowledge, modifying our whole attitude toward industrial toxicants, is currently being developed; for example, the fact that some persons appear to lack enzymes that maintain cellular metabolism in the presence of lead, while others lack enzymes which restore hemoglobin after exposure to nitro compounds and certain drugs.

The Training Branch, challenged by the widening gap between available personnel and needed manpower in the field of occupational health, is working at forced draft. The branch concentrates mainly on short-term courses not provided elsewhere.

Trainees include industrial physicians and nurses, State and local health officers, chemists, physicists, engineers, safety officers, and sanitarians.

Thirteen courses are scheduled to be given at the facility this fiscal year, two in Puerto Rico (one for sanitarians and one for industrial hygienists), one at the Industrial Hygiene Foundation in Pittsburgh, and another at the University of California.

The Training Branch also maintains a Technical Information Service, answering questions from the public about occupational health hazards—the toxicity of industrial compounds, the dangers of industrial processes, detection methods, and control procedures. The inquiries, mainly by letter and averaging 400 a year, come from all types of professional and nonprofessional people. Last year, 195 different subjects were covered in the replies given by the branch.

The Future

The Occupational Health Research and Training Facility will continue, as it has done in the past, to provide State instrumentalities, industrial and labor organizations, and Federal agencies with assistance in solving specific technical problems. But this service must stand upon a firm basis of first-class research and national leadership in assessing and tackling the problems of the future, with all the physiological, psychological, and social, as well as clinical, considerations that they involve.

We need to study more intensively the health effects of the approximately 500 new chemicals which are introduced into industry every year. We need, for example, to learn to what degree behavioral reactions are indicators of tolerance to toxic substances. We need to study heat stress in industry and how it alters workers' tolerances to other industrial hazards.

We need to know more about health hazard piled on health hazard. What about the worker who is exposed on his job to waste products of unknown toxicity, who also smokes two packs of cigarettes a day, who drives to and from work behind the belching tailpipes of other vehicles, and who inhales during all his waking and sleeping hours the combined effluvia from chimneys, burning municipal dumps, and still more motor vehicles? What about—and this is the heart of our mission—the total man in his total environment?

We need to know—and research by properly trained personnel will help us learn—more about working conditions which, if improved, can cut down interpersonal tension, psychosomatic manifestations, job dissatisfaction, and absenteeism.