

The many dangers that lurk at places of work

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"A FENCE at the top of the cliff is much better than an ambulance at the bottom," quoted Dr. Elishu Richter, a researcher at Hebrew University's Department of Medical Ecology and Industrial Medicine at the School of Public Health at the Hadassah Medical School. Although Richter attributed the remark to Dr. Paul Ruelle in his efforts to fight malaria in India, the idea that prevention is better than treatment is just as applicable in the Israeli workplace today.

For the past 11 years Richter has been assessing the exposures and effects of hazardous materials in the Israeli workplace and attempting to pinpoint high-risk groups. Richter's early work in Israel involved studying blood lead levels in workers at lead battery and lead smelter plants.

He found that many workers had received highly toxic exposure from fumes and dust. Lead in the body has been shown to be a risk to the central nervous system and cause IQ impairment in children.

Later studies of silica exposure in the ceramics industry and mercury exposure in the thermometer industry led Richter and his colleagues to the conclusion that toxic exposure was not limited to one industry or workplace. In many cases, said Richter, physicians and labour inspectors underestimated the severity of exposure and effects.

The implications of these early studies may actually have been far worse than was realized at the time. "Our concepts of safe exposures for many agents have [decreased] dramatically in recent years," said Richter. "Take lead: there is now evidence that...so-called background or normal exposure for urban residents in the U.S. are now implicated

in increasing hypertension and IQ impairment in children." For some chemicals, he continued, "there is no such thing as a permissible level of exposure."

Working with Richter in his research are Dr. Jaakov Mazilah and Dr. Steven Barron from the Haifa Medical School, and Dr. Nachman Gruener from the Carmel Hospital in Haifa.

Richter showed a photograph of an agriculture worker in the Galilee. The worker was mixing an organophosphate-based insecticide in a small plastic jug from stock solutions contained in two large metal drums. While performing the task, the worker spilled a significant amount of the potent neuro-toxic agent onto his shoes. "This is an example of a problem which shouldn't exist at all," Richter said. The spill could be avoided if the pesticide was sold in ready-to-use containers, or if the material came in containers with a built-in closed mix-

ing system - containers designed not to leak or spill.

THE PROBLEM is that many of the processes used today in Israel rely on the worker to "minimize the effects of design mistakes." Engineers should instead design processes to perform "in a complementary and forgiving manner." For example, instead of using glove-boxes designed to isolate an experimenter from the substance he is using, many technicians using hazardous materials in Israeli laboratories are told simply to "be careful." "This is an outdated and backward approach, indicating technological lag," commented Richter.

Assessing worker exposure to hazardous materials is especially difficult because many of the exposures result in impairment to short-term memory and reaction speed, rather than illnesses which are immediately apparent to an outside observer. Working with Dr. Zoli Zlotogorski of Hebrew University's psychology department, Richter is "trying to find out if there are impairments in intelligence, memory, reaction time and perception from the everyday use of organophosphate containing pesticides in agriculture." They are also concerned about the effects of drift of the pesticides to adjacent communities, such as surrounding kibbutzim. The project is part of a 10-nation World Health Organization Europe project monitoring the health of workers exposed to these chemicals.

The current project is of interest, Richter explained, because it is one of the first to examine the risks of "sub-clinical exposures" - that is, exposures that do not cause immediate poisoning - in groups of workers and residents. The conclusions of the study will have important implications for the future uses of these pesticides.

Although risk assessment is becoming popular in Israel today, Richter criticized most current efforts. "Risk assessment in Israel smacks of charlatanism. Most risks have not been properly assessed. A is underassessing the risks to B and then does not share the results of the studies with B. You can't have risk assessment without authentic right-to-know practices." As an example, Richter recalled a 1981 statement by the director-general of the Health Ministry that Israel had no asbestos problem. The statement had been based on incomplete assessments. "We use this as a teaching example in the medical school of how not to assess risks," Richter said.

According to Richter, risk assessment in Israel has been flawed by two key issues. First, the methods used to assess risks have underestimated the dangers. Second, follow-up studies are often insensitive to the time lag, so a medical problem which manifests itself years after the exposure is rarely seen by those conduct-

ing the risk assessment study. "In the short term the risk cause-effect relations are missed because the risks are not specific. And with hazards with long-term effects the latent period is not taken into account. It's like looking for grey hair on children in third grade," he said.

THE HAZARDS in Israeli factories today are often made worse by the buildings' ventilation systems. Instead of exhausting vapours outside, many systems circulate toxic fumes throughout the building, Richter said.

Many believe that Israel's new high-tech industries will be free of hazardous materials, but these businesses also have their share. For example, arsenic is used in the manufacture of integrated circuits and a variety of dangerous solvents are used in the production of printed circuit boards. Worker safety was often ignored in the early days of California's Silicon Valley, and "now the chickens are coming home to roost," Richter said.

One of the biggest problems in eliminating hazardous exposures is finding them. In Israel 30-40 per cent of the workforce is in small work establishments which are not reached by the existing network of health and safety programmes. "Even with all the limitation of these programmes, something is better than nothing," said Richter.

A worker in a small shop can be exposed to substances which are just as toxic as those found in the largest factory. Many industrial cleaners and solvents, for example, have both immediate medical side-effects and are potent carcinogens. In an attempt to reach those workers in small establishments, the Hebrew University researchers, in conjunction with the Histadrut, are planning an "experimental programme to detect and control hazardous exposures in small work places, and to make use of a field station to provide personal first aid and preventive services, such as blood pressure screening and smoking cessation programmes," Richter explained. The pilot programme will monitor approximately 4,000 workers in the Givat Shaul area in Jerusalem.

Although Richter praised the outreach of Kupat Holim's occupational medicine network, he said that it frequently misses exposures at a time and level when effective prevention is possible. The current system more resembles the ambulance at the bottom of the cliff rather than the fence at the top. Israel's existing medical network is "not yet programmed" to realize when a patient's illness is the result of work-related hazardous materials exposure. How can a doctor know if a patient's shortness of breath is the result of dust he inhaled 10 or 15 years ago? The real solution, said Richter, is to design processes and workplaces to limit exposures in the first place.

away, thus indicating that the disease is not present.

In the past, chlamydia detection often required a biopsy, in which tissue is surgically removed from the body, since the bacteria are often lodged in human tissues or organs.

THE CHANCES of surviving a head-on collision can be increased by 50 per cent with a new device, a seat-belt tensioner, now being installed in Mercedes-Benz and Saab cars. In the case of a head-on crash, a small charge similar to that in a shotgun shell fires, forcing a piston up a cylinder. This piston pulls a wire attached to the seatbelt take-up reel, snapping the belt tight. According to the August edition of *Popular Science*, tests with instrumented dummies show that the tensioners hold the passengers and driver more tightly in their seats than do regular seatbelts, reducing the chance of injury, or even death.

MICROWAVES cook food in a fraction of regular oven heating; low soundwaves are being used to preserve food.

creosote and the entire chimney can catch fire - heating up so much that it can melt the mortar holding the bricks together. Thus chimney sweeps are needed to clean them regularly, to prevent the buildup of the flammable layer. The average charge per chimney cleaning is \$55, and one can make \$1,000 or more per week working full time, says the Maine firm. That makes chimney sweeping many cuts above the low-class image of the sweep as depicted in *Mary Poppins*.

A POPULAR item among would-be smugglers arriving at Israel's ports of entry will probably be the Stick-up, the miniature TV manufactured by the Citizen Watch Company and sold in the U.S. for \$150. The black-and-white model, with a 7-cm. screen, hangs on the wall with Velcro tape, for viewing in the kitchen or bathroom. It can also be used in the back seat of the car. It takes standard C batteries and produces 20 hours of viewing on one set. The TV, which weighs less than half a kilo, is meant to be a permanent wall fixture, rather than a portable set.

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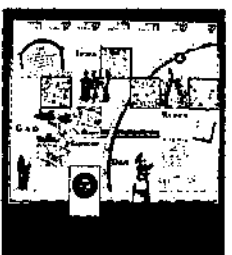
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