

Milk Monitors

pauline jackson

Methodologies for the Study of Low-Level Radiation in the Midwest, Charles Huver *et al*, Millville, MN, Anvil Press, 1979, \$ 5.

THOSE who seek an easy introduction to the dangers of low-level radiation would do better to read the pamphlet-length summary of this book, *Nuclear Waste - The Time Bomb in our Bones*. Yet this extraordinary book is undoubtedly a landmark contribution to the debate over nuclear health hazards. It is a product of detailed investigation by a team working with Land Educational Associates Foundation Inc. (LEAF), a citizens' research and resource network who publish books, newsletters, engage in lobbying and popularise research findings for anti-nuclear activists.

This book appears to be their most ambitious attempt yet to take on the state at its own game: the monitoring of low-level radiation releases and their impacts on human beings. Their work is intended as a critique of the U.S. Environmental Protection Agency, the U.S. Atomic Energy Commission and those private or public agencies who, in the opinion of the authors, downplay the hazards of low-level radiation. Their starting point, therefore, is an alternative method of monitoring the results of low-level radiation release, to combat the defects, errors, inadvertent omissions and mistakes of official monitoring.

Their approach assumes that the problems surrounding monitoring can be reduced to precise errors, definite defects, certain omissions and accidental mistakes - an assumption that is far from proven in the book. Certainly, the authors succeed in revealing an inadequacy of corporate and state monitoring. But they present the inadequacies more as a series of random and accidental oversights than as a concerted strategy by supporters of the nuclear industry to misinform the public.

Huver *et alia* are critical of monitoring methods but not of monitoring as such. They would not go so far to argue monitoring for low-level radiation (or low-level toxic chemical exposure) has become a fetish of the chemical and nuclear industry, used to lull the public into believing that a quantifiable measurement is equivalent to quantifiable control over releases (as argued by Levidow and Pomata in *RSJ 9*). On the contrary, the authors accept monitoring and seek its extension and perfection by a more sensitive, all-encompassing methodology.

To illustrate their perspective: an example cited in the study is the frequent use by nuclear proponents of the idea of 'the average dose' of low-level radiation, which gives an 'average' population a once-off hit of radiation and then allegedly disappears. The authors expand at length on the inadequacy of monitoring which fails to test for the consequences of all 189 radionuclides which can have an impact on health, with tragic consequences in cancers of specific organs of the body of individuals. The monitoring of selected radionuclides can be attributed to an inadequate methodology, or it can be con-

ceptualised as a deliberate attempt to conceal health hazards, that is, as a political choice by state and corporate scientists to hide health risks from the population. If all 189 radionuclides were monitored and the results rendered public, this would imply that the nuclear industry and its state supporters did care about health - an assumption that proved fatal for nuclear activist and trade unionist Karen Silkwood, who was assassinated while attempting to prove the hazards generated by her own nuclear workplace.

The LEAF study provides some useful insights into milk monitoring techniques. Milk monitoring had been going on for years in Wisconsin, where the research team was based, so records of the results were available from various monitoring stations over a period of years. Examining the records, they found evidence of radioactive substances which could only have come from atomic fallout during the 1950s. Matching the peaks and drops in measurements with information in tests carried out in the atmosphere, they demonstrate the continuing impact of radiation on a population who were perhaps only children at the time of the test. They suggest a method of calculating the half-life of radioactivity still in the bones of adults who were exposed at the time, and who would be vulnerable to cancer today.

The authors were surprised to find that the records were blank for considerable spans of time. In some records, the same results from monitoring appear on consecutive readings, from which they surmised that NO monitoring of milk had been carried out during certain periods, while on others the results of the preceding tests were copied into the records. In addition, monitoring results of *no* radioactivity were to be found in the Wisconsin records. This provides the authors with an occasion to dissect some arguments around 'detectable levels' of radiation. In this regard they remark: "... it is obvious that realistic dose estimate cannot be attempted by assuming that concentrations below a "detectable level" must be interpreted as meaning that absolutely NO iodine-131 is present". (pp. 61-62).

The statement reveals a weakness in their analysis of the purpose of monitoring in the first place. If the purpose of monitoring were to reveal the presence of radioactive substances in the milk, exact and precise measurements (however miniscule) would no doubt have been recorded. If the purpose of monitoring is to detect low-level radiation at and above the 'safe' threshold levels, then there is no need to record tiny amounts of radiations, since such tiny amounts are presumed by the monitoring agencies to be safe. The milk monitoring records which appear so defective in the eyes of the researchers are undoubtedly very adequate from the standpoint of the agencies doing the monitoring, since the test results conform to their intention in monitoring: to prove

that radioactivity in milk is not at harmful levels... levels being the crucial word!

Not content with combing the state's radiation monitoring records for faults, the authors compare nuclear reactor manager and state interpretation of the results with their own interpretations. They note that nuclear reactor utility managers and owners managed to underestimate the results of the monitoring by half. The researchers attribute this underestimation to the use of formalin, which reduces the detectability of the radionuclide Iodine-131. Being cynical, one could also attribute the underestimation to dividing the original results by 2...

The study is extremely useful in its treatment of the food cycle and low level radiation exposure; this is perhaps the best section of the book. The authors insist on the importance of the food chain as a pathway for low-level radiation ingestion. The researchers examined the dietary patterns of the Wisconsin population, including the diet of so-called minority groups. In an implicit critique of the 'average' population perspective, they detail the differences in life-style among the Wisconsin population and the accompanying variations in eating and shopping habits. They calculate the predominance of dairy products in the eating patterns and then break down the dairy products according to whether or not they were extensively processed. They propose that those who eat processed (as opposed to fresh) dairy products were less likely to get radiation exposure, since the half-life of the radioactivity in fresh milk, for example, had had more time to decay during the processing.

If one hadn't been turned off dairy products by this stage, worse is to come in their assessment of other food products. The consumption of wild berries, foods growing in marshy areas and wild venison were extremely popular in Wisconsin. The topography of Wisconsin—with its snowfalls and extensive marshy, lichen and moss-maden lands—is apparently conducive to the establishment of radiation pathways. Animals and foods with their sources in these terrains are more likely to 'carry' radioactivity from previous fall-out than other foods. Poaching of venison is so popular as to make venison a staple diet for many Wisconsin families; the deer graze on the marshy lands close to the areas of the state with the highest concentrations of Wisconsin residents who are either vegetarian, fresh-food conscious or opposed to processed food, the authors point out the radiation hazards of diet containing berries, unmilled grains and soyabean. Not even sunflower seeds escape their scrutiny as concentrators of Strontium-90! Combining factors - of diet, age, proximity to nuclear reactors, waste facilities for reprocessing nuclear materials, age when testing was being undertaken - the authors attempt to devise a methodology for examining the radiation exposure already received by the population of Wisconsin and the amounts that are still decaying in their bones from previous exposures as the half-life of radioactive substances continues to decay over decades. Their methodology resembles that used in sociology and psychology for multi-variable factor analysis.

In the absence of a chapter presenting the authors' scientific assumptions or philosophy of science, the reader is obliged to deduce for her/himself where the authors stand

on monitoring, research methods, source credibility, statistical methods and so many other fundamental issues. One can draw some conclusions from their concern to enlarge the numbers of radionuclides and radiation pathways which are submitted to monitoring and their interest in the impacts on individuals in specific geographical zones, districts with distinct living and eating patterns. Their work rejects hypothetical models of the impacts of low-level radiation on 'average' populations and attempts to reconcile multiples, types and volumes of radiation emissions with groups living in their path or liable to consume radioactive contaminated foods along their pathways. Put another way, the authors reject a robotic conceptions of human beings—robotic in the sense of each person being an exact replica of the next in history, culture, lifestyle, age and so on. Instead they are attempting to humanise monitoring methodologies, to give them relevance to local communities, such as those living in the various counties of the State of Wisconsin.

It is to the credit of LEAF that they responded quickly to popular demand by publishing in pamphlet form a most readable summary of the book: *Nuclear Waste - The Time Bomb in our Bones*. Besides this 16-page cheap version of the book, LEAF have 3 informative brochures presenting the salient aspects of selected pieces of their research, aimed at Wisconsin's commune and health-food population. These formats - pamphlets and brochures - show that LEAF is capable of citizen research which unites grassroots activists and researchers into dialogue. It is all the more surprising, therefore, that *Methodologies* does not rise to the same standard of accessibility as their other publications.

It is all the more important to have an accessible presentation of their philosophy of science when one realises the conclusion that Huver *et alia* draw from their research. They predict that Wisconsin 14 year-olds have an increased risk of cancer from just 3 radionuclides in their food - a risk double or more than the normal cancer risk. They predict that 14 year-old Wisconsin girls have an increased risk from all cancers equivalent to 25 per cent above the normal cancer risk. The authors remind us:

Some of the Strontium-90 that found its way into baby's milk bottle in the early 1950s is still in the cells of that individual. Every year it delivers an additional 'annual' dose. Every year it increases that individual's risk of cancer (p. 168).

The risk of cancer and the suffering it implies for individuals is all the more astounding when one considers that, by the time these 14 year-olds become middle-aged, they may never have been near a nuclear reactor, may live on another continent, may never have worked in the nuclear industry and may imagine themselves safe from exposure. LEAF is saying that the damage has already been done. Low-level radiation is inside the environment of Wisconsin and cannot go away. In the words of the authors:

It has been 'lost on the way to the bank' - it is irretrievable - it will never be safely contained in some ultimate waste storage repository. It will inevitably affect the health of individuals in the Wisconsin case study and others yet unborn (p. 179).

For authors of *Methodologies* there is no 'return to normality' after a reactor closes down or after testing halts. Low-level radiation still continues its assault on the cells of in-

dividual humans. For this protracted notion of war against radiation hazards, this book's contribution to the literature on low-level radiation is a welcome addition. For those who seek a critical analysis of monitoring as a tool for politically cooling-out agitated residents and citizens, this is not the text to peruse. But it could serve as a useful reference source for the wider debate about disinformation techniques employed by the nuclear industry and its supporters.

References

LEAF, 3368 Oak Avenue, Stevens Point, WI 54481, USA.

LEAF, *Nuclear Waste - The Time Bomb in our Bones*, 1980, \$ 1.25.

LEAF, brochures on 'Radioactive Milk', 'Health Foods and Radiation', 'Deer Hunters Beware', *Sierra Club Waste Paper Bulletin*, Vol. III, no. 1.

Les Levidow, 'Three Mile Island - The Ideology of Safe Level' as a Material Force', *RSJ* 9 (1979), 82-92.

Gianna Pomata, 'Seveso - Safety in Numbers?', *RSJ* 9 (1979), 69-81.
Deborah Rogers (ed), *Threats to Wisconsin Communities*, Pure/Wager, 1981, 66 pp. Available from 306 North Brooks Street, Madison, WI 53715.

Ernest Sternglass, *Secret Fallout - Low-Level Radiation from Hiroshima to Three Mile Island*, NY. McGraw-Hill, 1981.

(Reprinted from *Radial Science Journal*, Issue on 'No Clear Reason' 1984.)

Hunger and Myth of Plenty

bernard d'mello

Empty Stomachs and Packed Godowns: Aspects of the Food System in India by Bharat Dogra; published by Bharat Dogra, D-7 Raksha Kunj, Paschim Vihar, New Delhi 110 063; 1987, pp VIII + 126, Rs 50.

THE stock of foodgrains in India has increased from 11.7 million tonnes in 1980 to 29.2 million tonnes in 1985. However, this huge stock of foodgrains is not an indication of plenty. Rather, it is one of the symptoms of lack of purchasing power of the poverty stricken millions who suffer from hunger and malnutrition. Bharat Dogra, a free lance journalist, presents a radical outline of the food problem in India.

More than 70 per cent of rural households lack the means to avail of even the least-cost balanced diet as recommended by the Indian Council of Medical Research (ICMR), which is the bare minimum ration. According to the author, the landless labourers and peasants operating upto one hectare of land, who constitute 47 per cent of the rural agricultural population, experience hunger and malnutrition in the most acute form. In several villages where land is infertile and in highly drought-prone areas, peasants operating more than one hectare of land also suffer from acute hunger and malnutrition. The single most important cause of hunger and malnutrition is inequality which deprives a majority of the population of access to resources which can be employed to produce food or yield an income for purchasing food.

Is India self-reliant in food? Self-reliance in food is defined as the ability to produce adequate quantities of all the food items which are part of the diet of our people and are an important source of nutrition for them. The ICMR has worked out the per capita requirements of basic foods for different age groups doing different types of work. This is multiplied by the total number of people in these age groups doing different types of work and summed up to get the requirements of basic foods at the national level in India.

Domestic production falls short of requirements in cereals, pulses, milk and oils and fats. Large quantities of edible oils and dairy products are imported. Besides large quantities of inputs used in the production of food like fertilisers and pesticides are imported. Thus India is not self-reliant in food which is contrary to what is being claimed in official quarters.

On the other hand, agribusiness promotes a massive wastage of food. In its ruthless search for profits, it ignores and hinders the basic task of making nutritious food

available to a majority of the people. For instance, the loss of nutritious ingredients in the course of milling of rice and hydrogenation of edible oils.

A few regions produce a surplus of foodgrains (e.g., Punjab and Haryana) while others remain deficient (e.g., Bihar, Madhya Pradesh, Orissa and West Bengal). Similarly some crops have performed reasonably well (e.g., wheat) while production of some others have relatively stagnated (millets and pulses). The per capita availability of millets (jowar, bajra, ragi etc), the food of the poor, has been declining. The production of pulses (chana, urd, mung, kulthi, masur etc), the poor persons protein, has stagnated. The biggest failure of the green revolution is the failure of high yielding varieties (HYVs) of rice. HYVs have failed to give the promised and much publicised higher yields despite the application of high amounts of fertiliser and irrigation water. The main reason for this failure is the high pest and disease susceptibility of the new HYVs relative to the resistance to disease and pests of the older varieties.

There is an interesting chapter on the long term adverse environmental effects of the green revolution development strategy in Punjab. The growth of legume crops (e.g., grams) in rotation with cereal crops and inter-cropping practices used to be beneficial for maintaining the fertility of the land. However, during the green revolution period, the area under pulses went down from 13.4 per cent of the total area under crops in 1966-67 to 3 per cent in 1982-83 and the area under oil seeds has gone down from 6.2 per cent of the total area under crops in 1966-67 to 2.6 per cent in 1982-83. There has been a greater reliance on chemical fertilisers for maintaining the fertility of the soil relative to the use of crop-rotations, inter-cropping practices and dung. This tendency to rely more on chemical fertilisers for maintaining the fertility of the soil relative to other better and cheaper methods has been criticised by ecologists and other specialists. Thus Francis Moor Lappe and Joseph Collins write in their classic, *Food First* that "The more one relies on chemical fertilisers instead of manure, compost, crop rotation and green manure, the more the organic matter declines, the less able plants are to absorb inorganic nitrogen in chemical fertilisers. This helps to ex-