

WHY DREAD WHAT IS PREVENTABLE?

Yana Mintoff Bland

*Do not go gentle into that good night,
Old age should burn and rave at close of day:
Rage, rage against the dying of the light.*

Dylan Thomas (1946)

Cancer cases and deaths in the Maltese Islands have been rising while most other killers, such as heart disease or diabetes, have been declining.¹ Whilst the overall cancer rate remains below most industrialised countries, the increase of breast and lung cancer, especially since the 1970's, has been phenomenal. It is the purpose of this paper to examine possible causes and suggest preventive action.

Today, more than ever before, the price of health is vigilance, and this vigilance means that we must recognize not only the poisons in our environment but also the efforts on the part of industry to resist, in the name of profit, the removal of these carcinogens and mutagens, as well as government tolerance of these efforts
(Glasser, 1979: 173)

There is no doubt that industry is responsible for a great deal of cancer. Many known carcinogens are the products or by-products of profitable, multi-national companies. The oil, chemical, petrochemical, asbestos and automobile industries; the pharmaceutical, agricultural and food industries are among a few of the giant cancer causers.

When the directors of these multi-national corporations control the funds of major investigate bodies such as the Memorial Sloan-Kettering Cancer Centre, the American Cancer Society, and the National Cancer Institute, then we have a case of the wolf "protecting" the sheep.² Cancer management itself has become big business with a concentration of control, interlocking directorates, financial services, professional conformity, reciprocal favours and common interests. Many of us have an uneasy suspicion that the air, water and food we inhale and ingest are becoming increasingly unhealthy and that bombardment with so many industrial and military pollutants is inevitably leading to horrific breakdowns in our immune system. Few of us know, however, just how our fears can be turned into vigilance and our vigilance rewarded by reduced cancer suffering.

The conflict between health and profit has taken many forms throughout history. In the 1960s the climate was right in industrialized countries for health and safety consciousness to rise. The shortage of labour, the civil rights

movements, the growing environmental, anti-nuke and anti-chemical & biological warfare movements³ co-incided with a growing awareness that cancer constitutes not an individual but a social problem. It, more than any other disease, epitomises the callous disregard for public health currently displayed by military-industrial economies of the world.

As a result of hard-hitting exposes of work-related cancers and community cancer hot-spots close to chemical and petrochemical industries or close to nuclear missile test sites and nuclear plants, some basic regulations were enacted in the 1970's in most industrial countries.⁴ Was this legislation effective? Or did industry find a way to avoid and weaken restrictions? Were smaller countries like Malta affected adversely? To answer some of these questions, I will first discuss one dangerous pollutant, asbestos, and the rise in lung cancer.

ASBESTOS

By the beginning of this century asbestos had become a big industry. Mined mainly in Quebec, Canada by Johns-Manville Corporation, asbestos rock is manufactured into over a thousand different products including water tanks, ironing board pads and stove linings. It has been used widely in piping, insulation and brakes because of its resistance to heat and fire. But asbestos is also a most dangerous pollutant. Its microscopic fibres are virtually indestructible. People who work or live in the vicinity of asbestos inhale or ingest these small, tough fibres which are then trapped by the membranes or the lining of the lungs or by the stomach or colon. Scarring of the lungs takes place and after some years scar tissue replaces healthy tissue. This condition is known as asbestosis. The victim regresses from persistent coughing to difficulty in breathing and eventually dies.

“But asbestosis is only one of the dangers. The main problem is cancer. Lung cancer forms within and around the scar tissue. Another form of cancer attacks the linings of the lungs. This is called mesothelioma. Once a rare disease it has now become common among asbestos workers. Other kinds of cancer are also typical results of asbestos exposure”. (Moss 1980: 237)

Moss, writing in 1980, goes on to point out that not only asbestos workers are in danger but also anyone who has lived near asbestos. Family members are particularly at risk as the invisible fibres attach themselves to clothing and eventually permeate the household.⁵ U.S. Department of Health, Education and Welfare statistics estimate that between 4 million and 8 million workers may die of asbestos-related diseases. A high percentage of all urban dwellers have asbestos fibres in their lungs at autopsy – even if they never worked near asbestos (Brodeur, 1974). Government officials state that 10 to 15 per cent of *all* cancer deaths are due to asbestos alone. (Brodeur, 1985)

Although asbestos manufacturers, the medical profession and life insurance companies were well aware of the hazards of asbestos by the 1920s, safety rules were resisted by the giant manufacturers and neglected by the government. The industry denied access to worker's medical records and aggressively dismissed the asbestos-cancer link. Not until Dr Irving Selikoff and his co-workers went directly to the unions involved was the full extent of the disaster revealed. For instance, they studied the health of the 632 men who had been in a New York pipefitters union in 1943. By 1977, Selikoff reported,

"instead of the 330 anticipated deaths there were 478 deaths.

Why did some 150 people die who were not expected to die? Well, there should have been 56 deaths from cancer, and there were 210. Instead of 13 deaths from lung cancer there were 93. One out of every three asbestos workers dies of lung cancer. This is simply a disaster!... Interestingly, too, instead of 15 deaths from cancer of the esophagus, colon, stomach and rectum there were 43... Obviously anyone who inhales dust also tends to ingest it." (Selikoff, 1978)⁶

In the U.S., there is now awareness of the asbestos peril. Asbestos workers have filed over \$2 billion in lawsuits against manufacturers.⁷ Regulations have tightened. In a massive cleaning up programme, asbestos has been removed from most public places. The asbestos industry has not, however, reduced output. It has simply moved its factories abroad, and increased sales to places such as Malta where very few people know that asbestos fibres break up into a multitude of smaller lethal fibrils; where regulations are lax (an exception being the Malta Drydocks); where mesothelioma is not diagnosed at death; and where health laboratories are under-equipped.

The practise of dumping hazards on more innocent populations has not been restricted to asbestos companies like Johns-Mansville or Raybestos. As the link between pesticides and cancer, smoking and cancer, or radiation and cancer have been exposed in the industrial countries, and as regulations have increased, so the runaway movement has gathered momentum. Carcinogenic pesticides are re-labelled and sold abroad; contaminated food is re-packed for export; hard-sell campaigns are focused on countries with rising real income but less experienced consumers; "dirty" factories are moved to new regions and countries without strict regulations. It is incumbent on governments of small and developing countries to understand and exercise their responsibilities in the wake of this onslaught of runaway companies; and it is a first priority that government agencies increase vigilance. The disturbing evidence that cancer has increased tremendously in Malta during the past twenty years is a clear indication that reaction is belated and much is amiss.

The profits of many companies have been and are being achieved at grave human cost.⁸ Even where regulations have been legislated, they are seldom enforced.

"One in every four American workers (approximately 21 million) currently may be exposed on either a full or part time basis to OSHA-regulated hazardous substances. Upwards of 40 to 50 million persons or 23% of the general population of the United States may have had exposure to one or more OSHA-regulated carcinogens or hazardous substances during their lifetimes".

(Senate Committee 1977)⁹

The grave estimates of both the human and socio-economic costs of occupational exposure to carcinogens led to the 1979 Guidelines in USA, but when jobs are scarce and deregulation in vogue, such human suffering and social scandals are sacrificed at the altar of the almighty dollar. For instance in 1991, the Occupational Safety and Health Administration, OSHA, will inspect fewer than 0.5% of jobsites in Georgia: a 1-in-200 chance of scrutiny.¹⁰ When deaths on construction sites are being ignored and tacitly condoned, deaths after twenty years (which is the average latent period for lung cancer) are even more easily disregarded.

The latest British longitudinal study of the relationship between cancer and social factors confirms that mortality from lung, stomach and cervical cancer is higher in the working class. "Lung cancer shows the largest class differential in males but in women the largest class differences are for cancer of the stomach and the cervix".¹¹ Specific site studies of naval shipyard workers 1958 - 77 by Najaran and Cotton show a two-fold mortality rate increase from all cancers and an astounding five and a half-fold increase from leukemia. They posit multi-factor causation: in particular exposure to asbestos, welding fumes and nuclear radiation.¹² A retrospective occupation cohort study of Finnish shipyard and machine-shop workers from 1945 to 1960 shows "an increased risk of lung cancer among the shipyard workers. The most probable explanation for this finding is exposure to asbestos".¹³ The excess was most prominent for pipefitters, who were especially exposed to asbestos fibres. Autopsies of the lungs of men who had been exposed to asbestos dust at the Royal Naval Drydocks of Devonport, Plymouth showed a correlation between occupational asbestos dust exposure and severity of lung pathology.¹⁴ It is now scientifically accepted that all shipyard trades carry the risk of mesothelioma, lung cancer and pleural fibrosis caused by severe exposure to asbestos and other fibres. Some studies also show a thirty to forty per cent higher rate of lung cancer amongst welders exposed to stainless steel fumes, since chrome and nickel are cancer-causing agents.¹⁵

As Table 1 illustrates, many other substances have been shown to induce lung cancer in humans: acrylonitrile used in the production of artificial fibres; fertilizers; pesticides; herbicides and related compounds; solvents and dyes. Besides shipyard workers, many other occupations have been shown to be at a higher risk of dying from lung cancer. These include: cement and chemical workers; stone, clay, pottery and glass workers; foundry moulders and coremakers; fitters and metal dressers; metal plate workers and riveters; plumbers and lead burners; bricklayers and tile setters; coal tar and pitch workers; textile workers; plasterers, charmen, window cleaners, chimney sweeps; and radiologists.¹⁶ Radiologists are more likely to develop lung, breast cancer and leukemia. Radiation is also teratogenic, harming the fetus, as well as reproductive organs. It merits a fuller discussion forthwith.

TABLE 1: KNOWN CANCER CAUSING AGENTS AND SITE AFFECTED

Agent	Primary sites affected
asbestos	lung, GI tract, larynx, ovary
cadmium	lung, prostate
cement	lung, stomach
chromium	lung
nickel	lung
arsenic compounds	lung
beryllium	lung
bischloromethyl ether	lung, nasal
mustard gas	lung
iron oxide	lung
petroleum & oil mists	lung
coal tar fumes	lung, skin
tobacco	lung, bladder
acrylonitrile	lung, stomach, colon, bladder prostate
petrochemicals	lung, GI tract, liver, stomach
silica	lung
wood	lung, nasal
aluminium	lung
Halogenated Hydrocarbons Pesticides	
Aldrin	lung
Dieldrin	lung
Chlordane heptachlor	
Malathion	
Parathion	
Dinoseb	lung, foetus
Dioxins: TCDD, 2, 4, 5-T	sarcoma, non-Hodgkins lymphoma, lung, liver, foetus
Dibenzofurans	- ditto -
Carbon tetrachloride (CTC)	lung, liver
Ethylene oxide	leukemia, reproductive hazards
Unsaturated Halogenated Hydrocarbons	
Vinyl Chloride Monomer	liver
PCBs	lymphoma, lung, liver, foetus
Alar apple growth stimulant	breast
DES animal growth stimulant	breast, foetus, vagina
Depo Provera	breast, uterus
HRT	uterus, breast, ovary
chloroform in water	bladder, liver
nitrosamines in food & water	stomach, mouth, bladder
nitrite in food	lymphatic systems
benzene exhaust fumes, gas stations	leukemia
aromatic amines e.g.	
beta-naphthylamine	bladder
benzidine dye	bladder
mineral oil	skin, scrotum, cervix
Aldactone & Flagyl (drugs for high blood infections)	pressure & trichomonas

The evidence linking smoking to lung cancer has been widely accepted. Cigarette smoke contains a wide variety of mutagenic chemicals which irritate the lungs, become absorbed into the blood stream, circulate through distant organs, and concentrate in the urine of smokers. However, there are good grounds for concluding that the relationship between smoking alone and lung cancer is being overestimated. Many studies show that there “may be synergistic or multiplicative interactions between smoking and certain types of occupational exposure – especially asbestos – in producing increased risk of lung cancer”. (Epstein 1979: 152) In congested urban areas, the combination of vehicle exhaust fumes and industrial pollution enshroud cities in deathly haloes that cannot be disregarded in deference to recent propaganda that cancer is just an individual smoking problem.

Recent trends in U.S. site-specific cancers have brought the ‘smoking causes lung cancer’ mentality into question because bladder cancer, closely associated with smoking, has decreased while lung cancer has not. (Davis 1988: 633) Whilst individual smoking habits no doubt exacerbate lung cancer risk, individual attempts to quit smoking are undermined by the tobacco companies hard-sell techniques and by the increasing stresses of living in an economy-imposed rat-race. There is overwhelming evidence of societal, rather than individual, cause for the current epidemic of cancer. It is an ineluctable fact that chemical and nuclear pollution of our air, water, food and seas are the major cause of cancer.

What is produced, how it is produced and how it is consumed primarily determine the increasing trend in this terrible disease. However, conservative oncologists choose to ignore this evidence, while most cancer control experts argue only for more cancer detection and treatment. Neither will address the destructive and rapacious modes of production in today’s burgeoning military-industrial economies, or admit that the only effective cure for cancer is prevention!

“The very obvious and dramatic class differences in cancer mortality”¹⁷ and the specific occupational links to cancer are officially recognised in most industrialised countries. In Malta too, my research has shown that unskilled and skilled manual workers are much more likely to die from cancer at any age than professional and managerial workers. It is among the urbanised working classes that multiple causation conspires, and victims of cancer increase. My previous research on the location incidence of lung cancer supports this hypothesis.¹⁸

BREAST CANCER

Who sees variety and not the Unity wanders on from death to death.

Brihad-aranyaka Upanished

Breast cancer does not kill as many women as lung cancer kills men, but now Malta has the highest recorded female breast cancer mortality rate in the world! At 35 per 100,000 per year it is, for instance, double the breast cancer death

rate in Greece.¹⁹ Its rising incidence in the Maltese Islands and in many other countries, such as the Caribbean, South America and Eastern Europe, has been dramatic.²⁰ Whilst the rate is much lower in USA, the number of women affected is not. A Breast Cancer Coalition of members concerned with the increasing incidence of breast cancer have collected 175,000 letters, one for each new diagnosis in 1991, addressed to the U.S. President and members of Congress. The letter begins, "Breast cancer is killing American women at an alarming rate – one every 12 minutes. Every three minutes another woman is diagnosed with this disease."

A severe drawback to informed analysis is the fact that occupational and environmental data is even less available for women than it is for men. And in the case of breast cancer, its very location suggests a hormonal as well as industrial determinant. The latest U.S. National Cancer Statistics Review puzzles over the long-term continuing increase in cancers of the breast and prostate. Brenda Edwards, associate director of the cancer surveillance programme noted that "60 per cent of the women diagnosed with breast cancer now have no recognized risk factor such as a family history of the disease". (NCI 1991) The list of known risk factors reflects the establishment's bias toward individual characteristics, omitting all reference to synthetic hormones, carcinogenic chemicals and irradiation.

Were all the recognized risk factors just statistical artifacts? For instance: family history of cancer: reproductive history including early menstruation, no children, first born child born after 35, late menopause: race and ethnicity; high fat and meat diet. These factors were found to be highly correlated to the number of breast cancer victims. But were researchers unable to see the forest for the trees? Is there an increasingly hostile environment for women's health and biological harmony? Against a pervasive carcinogenic backcloth, any one of these "risk" variables may trigger off a hormonal imbalance. "Breast cancer is a multifactorial disease," said Dr Dao to Rose Kushner (Kushner 1975: 107), "There just is no one single cause that works". Rose elicited this comment from the Chief of the Endocrine Laboratory in New York, after much probing.

Dr Dao stated: "Anything that upsets the body's hormonal balance contributes to a favourable environment for cancer growth in the breast". For instance, stress: "Plenty of hormones are secreted during stressful time: One hormone could stimulate another. A stress hormone that stimulated estrogen secretion could help to create the nourishing endocrine environment the cancer needs".

Most oncologists would agree that stress, whether individual or systemic, is a significant contributive factor. Inability to cope with the deep contradictions and fast changes of our times has an effect on our health and our resistance to disease. Whether this is seen as individual breakdown, general maladaptation, class alienation or women's oppression, it is scientifically referred to as the residual factor in cancer causation.²¹ Clearly, mind and body are inextricably related.

Stress may have particular relevance to female breast cancer. In the attempt to break free of their historical repression, women are caught between twin destinies: the ancient destiny to multiply and make the earth more fruitful; and the modern destiny to limit the number of her offspring, curtail or avoid breastfeeding and, when possible, enter the workforce.²² A traditional "cottage" spinner or weaver suffered greater economic hardships and higher mortality rates, especially among the young, but she was not torn from her home by the need to earn money; nor was she isolated within it to bear and rear her children.²³

The dramatic change in women's reproductive and productive roles is nowhere more abrupt than in the last three generations of women on the Maltese Islands. The stresses of such a sharp transition were exacerbated by socioeconomic changes which led to unhealthy habits and brought exposure to widespread chemical carcinogens and high irradiation levels.

There is also a recent and growing danger of excessive endogenous and exogenous hormones. What you eat affects, among other things, your hormonal balance. Frequent consumption of animal fats and meat leads to higher estrogen levels and higher cancer rates.²⁴ "Several researchers have pointed out that most of the meat we eat comes from female animals—hens and ewes, which are loaded with natural estrogens, or from castrated meals—steers and capons—whose androgen-producing testicles have been removed." (Kushner 1975: 108) Most animals are also reared under very stressful conditions and slaughtered in mass panic, leading to greater hormonal imbalance.

In addition, many animals are fed or injected with growth stimulants—exogenous estrogens—like diethylstilbestrol (DES). Since the 1940s hormones like DES have been widely used as a fattener and food additive for beef cattle and sheep and the 1979 US regulations are far from sufficient.²⁵

Many women have unwittingly been given prescriptions for one estrogen or another. The synthetic chemical substitute DES is among the hormones that have been liberally prescribed as oral contraceptives and morning-after pills; in estrogen-replacement therapy for menopause and miscarriage; for menstrual cramps and irregularities; and for general itching, acne and hirsutism. Other hormonal drugs such as estrone and estradiol prolactin have also been shown to stimulate breast cancer. Much hormone replacement treatment at menopause has been associated with the development of breast cancer in later life.²⁶ Some of these drugs, such as DES, also have the ability to cross the placenta, reach the foetus and then cause serious disease (e.g. vaginal cancer) twenty to thirty years later.²⁷

"Here's that which is too weak to be a sinner
Honest water which ne'er left man i' the mire."

(Shakespeare *Timon of Athens* 1607–8 Sc.2 Line 60 and inscribed
on the drinking fountain in the market square of Stratford-on-Avon).

Most drinking water is full of carcinogens: chlorine, reacting with organic material in water, produces hundreds of chemical by-products; some of which – like chloroform, DCA and TCA – are potent carcinogens. In summer, when more chlorine is added to water supplies, trihalomethane levels jump far above suggested health limits. Nitrate, which finds its way into water from sewage and agricultural runoff, also transforms into compounds which become potent carcinogens such as nitrosamines. Irresponsible handling and disposal of toxic waste, together with the contemporary pesticide-mania, lead to dangerous leakages into ground water and contamination of sea water.²⁸

Tracking all these contaminants is difficult and costly, but absolutely necessary. Water is life itself. We owe it our children to discover how many carcinogens are in that feeding bottle or glass of water. Yet with all the giant steps in missile technology and outer-planet research, the techniques for testing water are still archaic. "If you don't know what (chemicals) you're looking for, it's difficult to find out what's in water," says Washington State University's Richard Bull, a leading drinking-water authority. In addition, officials have looked at the risks from each known contaminant individually, when it is known that cancer risks multiply when carcinogens are added together. Chemicals are much more risky when mixed together, concludes Daniel Okun, professor emeritus of environmental engineering at the University of North Carolina.²⁹

"Food is the single most important route of exposure for humans to synthetic chemicals. In a year the average American eats about 1500 pounds of food containing nine pounds of chemical additives (other than sugar and salt)." (Epstein 1979: 179)

Many food additives have been shown to be carcinogenic. Whilst some do not have a proved direct link to breast cancer, food contamination is definitely a contributory factor. The slow upward trend in stomach cancer in the Maltese Islands, counter to the prevailing downward trend in most industrialized countries, is of significance here.

Direct food additives were once natural plant extracts; but these have been ousted by synthetic dyes based on coal tars. Many coal-tar derivatives are known carcinogens, for example, 2-naphthylamine and benzidine cause bladder cancer in occupationally exposed workers.³⁰ The red colouring agent, Red 2 or amaranth, used widely by the food industry, is also carcinogenic. But many food dyes have not been adequately tested. The long controversy over whether or not saccharin is a carcinogen highlights the inadequacy of many industrial and epidemiological studies.

Indirect food additives include the residue of pesticides and herbicides on vegetables and cattle-feed. Perhaps best known are the carcinogenic and mutative hazards of 2, 4, 5-t and the impurity, dioxin, that is produced in its manufacture.³¹ The human tragedy following explosions at manufacturing plants (Seveso, Italy in 1976 and Coalite, USA in 1968), the flagrant spraying

of Agent Orange herbicide (made of equal quantities of 2, 4, 5-T and 2, 4-D) by the American Troops in Vietnam, and more recently the explosion of Union Carbide's chemical pesticide plant at Bhopal, India (killing 1,700 people in only a few hours and injuring hundreds of thousands of residents) revealed the horrific dangers of these toxic chemicals to the world. A recent retrospective cohort study by Marilyn Fingerhut at the National Institute for Occupational Safety and Health, found that chemical workers exposed to dioxin (TCDD or 2, 3, 7, 8-tetrachlorodibenzo-p-dioxin) for longer than a year with more than twenty years latency, have a cancer mortality rate 46% higher than the general population. In the USA, prime sources of environmental TCDD have been traced to the use of leaded gasolines, municipal and hazardous waste incinerators and chlorine bleaching of pulp in the paper industry.³² (See Chart A below on the known risks of this pervasive contaminant).

CHART A

TCDD has several toxic effects

Death

Wasting syndrome

Thymic atrophy

Splenic atrophy

Testicular atrophy

Liver enlargement, fatty deposits, necrosis

Hyperplasia: gastric mucosa, urinary tract, bile duct

Squamous metaplasia: meibomian glands, ceruminous glands

Cloracne: hyperplasia, hyperkeratosis, altered pigmentation

Teratogenesis

Carcinogenesis

Immunosuppression

Enzyme Induction

Biochemical effects

Source: Environmental Protection Agency, U.S.A.

Little known is the fact that:

“the lipid solubility of pesticide residues and halogenated biphenyls leads to their selective concentration in breast milk...Their chemical stability and physical properties lead to their persistence in the environment.” (Raffle P.A.B. 1987: 962)³³

However in Malta, toxic pesticides, such as Malathion, and Vegadex weedkiller, are imported in greater and greater quantities and used widely, with little protection and no afterthought. Controls are few and outdated and spraying is generally done with great abandon. The sprayers, the sprayed, the environment, and those who consume the sprayed food are all contaminated.

The growing pollution of the air, water, food and sea by carcinogens multiplies the risk of cancer. Regulations are all too few and carcinogens are all too many. They include many pesticides, benzene, certain hydro-carbons produced by the chemical processing of petroleum, vehicle exhaust fumes, sulphur dioxide emissions from conventional power stations and – last but not least – ionizing radiation from X-rays, nuclear power stations, nuclear weapons-testing and nuclear leakages.

The health hazards of nuclear radiation have been curiously overlooked both by those fighting for nuclear free zones, who focus on fear of the ultimate explosion, and by those calling for cancer prevention programmes, who focus on cancer screening or anti-cancer diets.³⁴ Each ignores the invisible fallout that is bombarding us every day to the proliferation of nuclear equipment. Yet scientists know more about the cancerous effects of irradiation than that of chemicals.

Indeed, results accumulating from the atomic blasts at Hiroshima and Nagasaki, and from patients treated by X-ray therapy, strongly indicate that ionizing radiations can cause cancer in nearly all organs of the body, and that some effect is produced even by a low dose rate.³⁵ The Hiroshima and Nagasaki A-bombs led to an epidemic of leukemia and thyroid cancer. Atomic fall-out also led to higher rates of breast and lung cancer, especially after 25 years. Recent research by Dr Yoshimoto et al, taking a 1950 – 1984 timespan, suggests a higher susceptibility to radiation-induced cancers in prenatally exposed survivors than in exposed adults.³⁵ This augurs badly for those still in the womb at the time of the Chernobyl nuclear disaster.

The open-air atomic weapons testing carried out by the U.S. and other countries in the 1950s and early 1960s led to hazards that few people realized. In Southern Utah, 1979 reports show that two and a half more children died of leukemia there than elsewhere in USA and that other products of irradiation such as cataracts, thyroid disease and birth defects are relatively high.³⁶

Our exposure to radiation has increased most insiduously as nuclear missiles, nuclear power stations, nuclear transport, and nuclear waste recycling have become bigger and bigger business. In addition military secrecy concerning numerous accidents to nuclear submarines and ships carrying nuclear weapons, and the ever-increasing risk of such accidents – especially in the Mediterranean – make genocide a highly logical outcome. Denuclearization of sea, land, and space is vital for the future of human life on earth.³⁷

The geographic distance over which radiation leaks are dangerous, and their long-term effects, are inestimable. Recent research links Chernobyl to a rise in US death rates and shows that vulnerable groups – newborn babies and the elderly – also suffered higher death rates in 1954, 1955 and 1957 (peak years for atmospheric nuclear testing) as well as in 1980, the year of the Three Mile Island nuclear accident. The atmospheric testing of the mid-fifties also damaged the immune systems of babies, making the 25 – 34 age group more vulnerable

to Chernobyl, according to Dr Gould and Dr Sternglass.³⁸ Female breast cancer in Malta shows a tri-modal age incidence rate from 1970–80, suggesting that “three ancillary experiences should be taken into account in interpreting this data. The particularly high number of cases in the 70–74 age group indicates that these women may have been particularly vulnerable about twenty-five years earlier in the 1945–55 period.” (Mintoff 1990: 49). This period is when irradiation was at its first high point, with the 1946 US A-bombs on Japan and the above mentioned atmospheric testing of the mid-fifties. In addition, upwind to the north of Malta, France and Italy were increasing their nuclear power plants and nuclear arsenals. Israel, to the East, was doing likewise.

That irradiation was an important trigger to both breast and lung cancers, could be corroborated by the fact that the 1960's saw a large increase in Malta's skin cancer rates, and the past thirty years saw a general increase in skin cancer in the Mediterranean.³⁹

Of significance too is the yet unexplained rise in the incidence of birth defects. The acute short term effects of irradiation include sickness, nausea, headaches and balding; the long term chronic effects include leukemia, cataracts and cancers. But there are also important developmental (harming the pregnant woman on her progeny) and genetic (affecting reproduction) hazards of fallout. Children born to exposed women have a higher risk of mental retardation, nervous-system disorders, bone malformations, leukemia and other cancers. A tragic case in point are the “jelly babies” born in the Pacific Islands, where French atomic bomb testing was rife. The extreme vulnerability of the foetus to radioactivity in the first trimester of pregnancy is now a scientific fact. Even the smallest radiation dose will produce mutations in chromosomes of gonadal cells that become sex cells. A simple example is a sex cell with 47 (instead of 46) chromosomes, causing Downs Syndrome in offspring. Add to this the increasing exposure to developmental and mutagenic toxins, and we realise that our children are in great danger.

Interpretation of the 150% increase in Malta's breast cancer death rates from 1960–80 and the subsequent 33% rise in just eight years, 1980–88, includes the multiplicative effects of increasing exposure to irradiation and carcinogenic chemicals; widespread prescriptions for hormonal treatment; increased animal fat, meat and sugar in diets; and stress due to dramatic changes in women's reproductive and productive roles.

SUMMARY

The recent history of many carcinogens is a saga of official neglect, in complicity with industrial and commercial interests. Inherent limitations to cancer epidemiology do exist: for instance, long latent period and synergistic effects of cancer agents. But these limitations afford no excuse for the continuing subordination of public health to self-serving, short-sighted industrial, military

and political interests. Such interest groups are in the business of preventing prevention. The tactics they use include: minimizing the risks; diversionary moves: propagandizing the public; blaming the victim; controlling information; controlling public policy; exhausting the regulatory agencies; and flight to countries and regions more receptive to “dirty” industries.⁴⁰ Economists are employed to argue that benefits exceed the costs of continuing production. Lobbying, including daily conferences with congressmen and other politicians, is a way of life in industrial nations. As the cancer of corruption spreads through inhumane and uncontrolled military-industrial-political circles, so the proliferation of carcinogens increases throughout the world.

As a minimum, the following steps are urgently required on a local level:

- (a) Government increased responsibility for healthy economic development and increased vigilance against carcinogens and toxic chemicals, formation of an Environmental Protection Agency, regulation of all industrial and environmental poisons and carcinogens, mass education;
- (b) Legislation to have health and safety committees with executive powers on all worksites;
- (c) Improvement of women’s work conditions: increase in women’s freedom and ability to be productive members of society; increase in women’s knowledge and control of reproductive practices;
- (d) Limitation of the number of hormonal prescriptions and X-rays to the bare minimum necessary;
- (e) Mandatory tests for radioactive contamination of food, sea, water, air, e.g. imported grains;
- (f) Mandatory tests for carcinogenic substances: ban or limits on use, exploration of alternatives. Ban on the use of all asbestos and removal from all public places: school-to-school health surveys to test air and water for carcinogens and lead levels;
- (g) Strict control of the disposal of toxic wastes;
- (h) Strict control of the use of pesticides – introduction of permaculture farming techniques.

Coupled with the conservation of energy and the advocacy of denuclearization of the sea, air, water, and space through Mediterranean and international associations, the above *eight-point plan* is a priority. It could be the best present we ever gave our children.

My thanks to Malta Health Department Statisticians for their painstaking work in collecting data and to David Gee and Mick Balfour at the GMB Health and Safety Research Unit, London, for their correspondence and encouragement.

Dr Yana Mintoff Bland is a former lecturer in economics at the University of Malta.

Notes

1. Mintoff Y (1990) *Cancer in Malta* Economic and Social Studies, Journal of the Faculty of Management Studies, University of Malta 5: 38–63.

A primary data source are Malta Department of Health Statisticians.

Also see the Demographic Reviews of the Maltese Islands.

2. Moss R W (1980) *The Cancer Syndrome* Grove Press Inc NY. Especially Chapter 14 *Preventing Prevention*, and Chapter 16 *The Cancer Establishment*.

Dr Helen Caldicott warns that “with each launch of the (space shuttle) one quarter of 1% of the ozone layer is destroyed. So far the agency shuttle has destroyed 10% of the available ozone”. The agency charged with the worldwide monitoring of the ozone levels is NASA, which is responsible for the shuttle launches. Yet another case of the goat “guarding” the cabbage patch!

3. Sigmund E (1980) *Rage Against Dying Campaign Against Chemical and Biological Warfare* Pluto Press.

Murphy S. et al (1984) *No fire No thunder* Pluto Press, London.

4. For instance the British 1974 Health and Safety Act and the US 1979 Guidelines for the General Regulation of Carcinogens. This latter scheme established three fundamental principles:

(a) animal carcinogens must be recognised as human carcinogens;

(b) it is impossible to define a “safe” level of exposure to carcinogens;

(c) all carcinogens need to be treated in the same way, with standard regulations limiting exposure to the “lowest feasible level”.

The European Community Council Directive 80/1107/EEC short-term measures were that: (a) workers and/or their representatives at the place of work receive appropriate information about asbestos, arsenic, cadmium, lead and mercury, (b) there is appropriate health supervision of workers during the period of exposure to asbestos and lead.

5. Dr H.A. Anderson & Dr I. Selikoff found that chest X rays of 30% of wives and children of asbestos insulators and factory workers showed asbestos-related abnormalities: quoted by Brodeur P. (1985) pp. 339–340.

6. Selikoff I. Profs (1978) Speech to the Society for Clinical Ecology Key Biscayne, Fla., November 19 1978.

7. Brodeur P. (1985) pp. 324, 336, 339, 345.

Also calculates that property damage claims against Johns-Manville totalled \$50 billion in 1985 while the company was in bankruptcy proceedings.

8. Dramatic examples include: the hazardous waste leakages at Times Beach, Mo, USA (1983) which necessitated evacuation and federal government purchases of the entire town; the Love Canal, NY, (1980) toxic chemical exposures which necessitated evacuation of the community; the California train accident of 1991, in which thousands of gallons of insecticide poured into the Sacramento River, destroying all marine life for many miles.

9. Committee on Human Resources Hearing before the Subcommittee on Labour, US Senate (1978) *Monitoring Industrial Workers Exposed to Carcinogens 1977* NIOSH, DHEW, Government Printing Office Washington p.46.

Davis D.L, Schwartz J. (1988) *Trends in US Mortality: US Whites Males & Females 1968–83* The Lancet 19.3.88 pp. 633–635.

They find a rise in site-specific cancer mortality amongst elderly whites: lung ca in the 45–84 age group and brain ca in the 75–85 age group. Due to the fall in bladder ca mortality, which is strongly associated with smoking, they point to other factors at work, in particular the increase of carcinogens (such as synthetic organic products) at work and in the environment.

10. Strauss H. (1991) The Atlanta Journal June 9: 84.

11. Leon D.A. (1988) *Longitudinal Study 1971–85 Social Distribution of Cancer* HMSO London. The Lancet 12.3.88 p. 602.

Mould R.F. (1983) pp. 74–75.

12. Najaran T & Cotton T *Mortality from Leukemia and Cancer in Shipyard Nuclear Workers* The Lancet 13.5.78 and 2.4.88:783. Of interest is an Italian study by Bonassi et al (1985) *Mortality Studies of dockyard Workers in Italy* Am J. Ind. Med 7:219 – 227 An increased risk of lung cancer (O = 6.2, E = 37.5 RRI.65 95%CL = 1.3 – 2.1) was found in over 5,000 dockers employed in five Italian dockyards 1960 – 81. There was no evidence of excess smoking among these workers. Harris (1968) *Asbestos Hazard in Naval Dockyards* Annals of Occupational Hygiene V 11: 135 – 145.
 - Selikoff I. Profs (1979) *Asbestos Disease in US Shipyards* Mount Sinai Medical Centre NY.
 13. Tola S., Kalliomaki P.L., et al (1988) *Incidence of cancer among welders, platers, machinists, and pipe fitters in shipyards and machine shops.* British Journal of Industrial Medicine 45:209 – 219.
 14. Wagner J.C. et al (1986) *Correlation between fibre content of the lungs and disease in naval dockyard workers* Brit J. of Ind.Med 43: 391 – 395.
 15. Newhouse, Beamont and Weiss (1985) *Lung Cancer among welders* Journal of Occupational Medicine 23: 839 – 844
 - Blot, Fraumeni (1981) *Cancer among Shipyard Workers* Banbury Report n9 NY p. 37 – 49
 - Zobert, Welte, (1985) *Cross Sectional Study of Respiratory Effects of Arc Welding* J of Society of Occupational Medicine 35: 79 – 84.
 16. Raffle P.A.B. et al Editors (1987) *Hunter's Diseases of Occupations* Table 24.1 pp. 837 – 846.
 17. Doyal L. & Epstein S. (1983) p. 13
 18. High risk communication for lung cancer from 1970 to 1988 were the three dock inner cities of Senglea, Cospicua and Vittoriosa, the quarry areas of Qrendi and Mqabbba and other towns in the industrialized inner harbour region. And: "Over the 1970 – 80 period, 44% of all female breast cancer patients lived in the highly urbanised Inner Harbour Region whilst less than 38% of the total female Maltese population lived there." Mintoff Y. (1990) p. 51 and Tables 7 – 11 pp. 59, 60. High rates of most cancers have been related to proximity to toxic chemical waste disposal in many geographic studies including that of Najem et al (1985) *Clusters of cancer mortality in New Jersey Municipalities* Int J Epid 14: 528 – 537.
- Important geographic studies include:
- Muir C. et al (1987) *Cancer Incidence in Five Continents* Vol 5. Lyons IARC no. 88 WHO Geneva
 - Parkin D.M. et al (1988) *International Incidence of Childhood Cancer* IARC no 87 WHO Geneva
 - Gardner M.J. et al (1982) *Cancer: Variations in Mortality* BMJ 13.3.82. 284: 784n.
 19. Metlin C. (1989) *Trends in Years of Life Lost to Cancer 1970 – 85* CA: Cancer Journal for Clinicians 39:1 pp. 16 – 17.
 - Mintoff Y. (1990) *Cancer in Malta* The rise in breast cancer incidence and mortality rates in the 1970s is clearly shown in Figure 6, p. 47.
 20. Pike M.C. et al (1981) *The Epidemiology of Breast Cancer as it relates to Menarche, Pregnancy and Menopause* Banbury Report 8 Cold Harbour Springs Lab. NY.
 - Weitzman S. et al (1987) *Confronting Breast Cancer: New Options in Detection and Treatment* Vintage NY.
 - Jayant K. (1986) *Cancers of the Cervix Uteri and Breast: Changes in incidence rates in Bombay over the last two decades* WHO 64(3) 431 – 435.
 21. Bennette G. (1969) *Psychic and Cellular Aspects of Isolation and Identity Impairment in Cancer: a Dialectic of Alienation* Annals of the New York Academy of Sciences 164 Part 2 pp. 352 – 364.
 - Cox T. & Mackay C (1982) *Psychological Factors and Psychophysiological Mechanisms in the Aetiology and Developmental of Cancers* Sci Med Vol 16, pp. 381 – 396.
- Investigations suggest two main groups of factors are related to an increased risk of cancer: the loss or lack of closeness or attachment to an important relation in early life; and the inability to express hostile feelings or more generally the abnormal release of emotion. Growing evidence points to the link-role of the immune system between the central nervous system and cancer. For a discussion of the negative image given of cancer: patients Sontag S. (1978) *Images of Illness* NY Review of Books 9.2.78 pp. 22 – 29. And for a victim's tale of battle with this image and the

- fear of cancer see Lorde Audre (1980) *The Cancer Journals* Spinsters Inc NY Kelsey J.L. & Berkowitz G.S. (1988) argue however that "available evidence does not suggest that exposure to emotional stress increases the risk of breast cancer". p. 5616.
22. Tillion G. (1983) *The Republic of Cousins: Women's oppression in Mediterranean Society* Al Saqi Books London. Gives an interesting and unique historic discussion of this conflict.
23. Mintoff Y. (1990) *Health and Development in the Maltese Islands* Phd CNAALondon University of Malta, 302 – 304; 314 – 322
- Occupational studies have shown a significant correlation between breast cancer and chemist, radiologist and hairdressing jobs and reproductive hazards due to exposure to cytotoxic drugs while nursing. See Raffle PAB (1987): 953, 960. and Walruth et al (1985) *Causes of death among female chemists* Am J Pub Hlth 75: 883 – 885.
24. Kushner R. (1982) pp. 100 – 1
- Kelsey J.L. & Berkowitz G.S. (1988) p. 5615.
- Gorbach S.L. et al (1984) *The Doctor's Anti-Breast Cancer Diet* Simon & Schuster NY. Includes some good recipes!
- Seely S. & Horribin D.F. (1983) *Diet and Breast Cancer: the possible connection with sugar consumption* Medical Hypotheses 11: 326.
25. Laitman O (1981) *DES The Complete Story* St. Martins Press.
- Epstein S. (1990) *Losing the War Against Cancer: whos to blame and what to do about it.* IJHS 20:1 p. 53.
26. The Lancet (1989) *Hormone Replacement Therapy and Breast Cancer* 12.8.89 p. 368.
27. Epstein S. (1978) *Female Sex Hormones* pp. 214 – 240
- Raffle P.A.B. et al (1987) *Reproduction and Work* p. 960.
28. Hanson David J. (1991) *Dioxin Toxicity: New Studies Prompt Debate, Regulatory Action* Chemical & Engineering News 12.8.91 pp. 7 – 14.
- Hattemer-Frey H.A., Travis C. (1991) *Health Effects of Municipal Waste Incineration* CRC Press Boston
- Carpenter B. (1991) *Is Your Water Safe?* US News & World Report 29.7.91 pp. 48 – 55.
29. Quoted by Carpenter B. above.
30. Epstein S. (1978) pp. 178 – 189.
- Curtis F. (1987) *Review of the Colouring Matter in Food Regulations* London Food Commission. He summarises: "58 different colours can legally be used in food (in UK). Six of these are not permitted in other EEC countries. Amaranth, caramel, sunset yellow and brown HT are among the most suspect additives. Amaranth is banned in the USA, USSR, Austria, Greece, Norway and Malaysia. But it is used in large quantities in Britain to imitate the colour of blackcurrant in ice-cream and sweets. It causes mutations and possible birth defects and cancer in animals".
31. Watterson A. (1990) *Pesticide Health and Safety Policy in the UK: A Flawed and Limited Approach?* JPHP Winter: 491 – 503
- Sterling TD., Arundel A.V. (1986) *Health Aspects of Phenoxyherbicides* Scan J Work Environ Health 12: 161 – 73.
32. Fingerhut M. et al (1991) *Cancer Mortality in Workers Exposed to 2, 3, 7, 8 – Tetrachlorodibenzo – p – Dioxin* The New England Journal of Medicine Jan 24: 212.
- The Selected Cancers Cooperative Study Group (1990) *The Association of Selected Cancers with Service in the U.S. Military in Vietnam* Centers For Disease Control Atlanta, Georgia, USA. This is one of many studies that shows a higher risk of cancer after exposure to herbicides during the Vietnam war.
33. Raffle PAB (1987): 969.
34. Bertell R. (1985) *No Immediate Danger: Prognosis of a Radioactive Earth* The Womens Press London.
35. Yoshimoto et al (1988) *Risk of cancer among children exposed in utero to A Bomb Radiations* The Lancet 17.9.88.

Gall R.P. Hauser T. (1988) *Chernobyl 1 – The Final Warning* Hamish Hamilton London This is a logical but passionate appeal for global cooperation to prevent further radiation calamities whether from power plants or weaponry.

Stillbirths and miscarriages in the region of the 1986 Chernobyl disaster have risen 250%, while cancers were already recorded to have risen by 46% on this very day of writing (17-9-91) USA Today: 6A. "8,000 adults and 13,000 children face early death".

36. Fuller J.G., (1984) *The Day We Bombed Utah: America's most lethal secret.*

The Defense Monitor (1991) notes that "thyroid and bone cancers downwind of the Nevada Test Site are 8 and 12 times, respectively, higher than the national average." July 12, 1991.

37. International Coordinating Committee of the World Council (1990) *Petition for Peace, Health and Wellbeing* JPHP 11, 2: 259 Calls for a total ban on nuclear testing and effective elimination of nuclear weapons.

The Defense Monitor (1991) "There have been 1,900 nuclear explosions worldwide since Hiroshima and Nagasaki or *one explosion every nine days.*" July 12, 1991.

Walker B (1990) *Environmental Health Policies in the 1990's* JPHP Winter: 438.

38. Gould J, Sternglass E.J. research summarised in *City Limits* London, Jan 7-14, 1988.

See also: Greenpeace Mediterranean Research Documents and Friends of the Earth exposure of design faults in Britains advanced gas-cooled reactors so that up to 80 tons of "mildly radioactive carbon dioxide gas escapes several times a year from nuclear power stations in Kent, Hartlepool, Cleveland, Heysham and Lancashire". Reported in *The Guardian Weekly* May 15, 1988 p. 6. They also found evidence of radioactivity in London's drinking water in 1990.

39. Mintoff Y, (1990) PhD: 369, 370.

40. Moss R., (1980): 215-221

Bertell R. (1985): 263-268.

ILO Geneva (1982) *Prevention of Occupational Cancer International Symposium* Occupational Safety and Health Series no. 46.

References

ASTMS (1980), *The Prevention of Occupational Cancer Policy Document* ASTMS London.

BAROFSKY I Ed. (1989) *Work and Illness The Cancer Patient* Praeger, NY & London.

BAUM M., (1981) *Breast Cancer: The Facts.* Oxford University Press.

BERMAN D.B., (1978) *Death on the Job* Monthly Review Press, ZNY.

BLOT, FRAUMENI et al (1981) *Cancer among Shipyard Workers* Banbury Report n.9. Cold Spring Harbour Lab, NY.

BRODEUR P., (1985) *Outrageous Misconduct. The Asbestos Industry on Trial*, Pantheon Books, NY.

(1974) *Expendable Americans* Viking Press, NY.

COHEN G.A., (1988) *History Labour and Freedom* Clarendon Press, Oxford.

DALTON A.J., (1979) *Asbestos Killer Dust* British Society for Social Responsibility in Science London.

DOLL R & PETO R., (1981) *The Causes of Cancer* Oxford University Press.

DOYAL L. & EPSTEIN S., (1983) *Cancer in Britain: The Politics of Prevention* Pluto Press London.

DOYAL L. & PENNEL I., (1979) *The Political Economy of Health* Pluto Press, London.

- DUBOS R., (1968) *Man, Medicine and Environment* Pall Mall Press.
- EPSTEIN S.S., (1978) *The Politics of Cancer* Sierra Club, San Francisco.
- FOSTER H.D. *Reducing Cancer Mortality A Geographical Perspective* University of Victoria, Canada.
- FULLER J.G., (1984) *The Day We Bombed Utah* New American Library.
- GADANT M., (1984) *Women in the Mediterranean* Zed Books, London.
- General Municipal Safety Circular (1982) *Asbestos Disease: No 281 Shipyard Workers* G.M.B. Health & Safety Unit, London.
- GLASSER R., (1979) *The Greatest Battle* Randon House NY.
- GRAHAM F. Jr., (1970) *Since Silent Spring* Houghton Mifflin, Boston USA.
- ILLICH I., (1977) *Limits to Medicine* Pelican Books, Britain
- International Labour Office Symposium (1982) *Prevention of Occupational Cancer* Occupational Safety and Health Series No. 46., Geneva.
- ISRAEL L., (1980) *Conquering Cancer* Pelican Books, Britain.
- KELSEY J.L, BERKOWITZ G.S. (1988) *Breast Cancer Epidemiology* Cancer Research 48.
- KUSHNER R. (1982) *Why Me?* The Saunders Press, Philidelphia.
(1975) *Breast Cancer. A Personal History and an Investigative Report* Harcourt Brace Jovanovich. NY & London.
- LAIMAN ORENBURG C., (1981) *DES The Complete Story* St Martins Press NY.
- LE SERVE, VOSE et al., (1980) *Chemicals, Work and Cancer* Nelso, London.
- MARTIN D., ECKER M.D., NORTON J.B., (1981) *Radiation* Vintage Books NY.
- MCDONALD J.C. (1978) *Exposure Relations of Malignant Mesothelioma* Proceedings of the Asbestos Symposium Edited H.W. Glenn. Randburg National Institute of Metallurgy. S. Africa.
- MELKO M., (1990) *Peace in Our Time* Paragon House NY.
- MOSS R.W., (1980) *The Cancer Syndrome* Grove Press NY.
- MOULD R.F., (1983) *Cancer Statistics* Adam Hilger Ltd Bristol.
- MURPHY et al., (1984) *No Fire No Thunder* Pluto Press London & Sydney.
- National Union of Agricultural and Allied Workers (1980) *The 245 - T Dossier: Not One Minute Longer* Russell Press NHOM England.
- NAVARRO V., (1981) *Imperialism, Health and Medicine* Pluto Press London.
- PARKIN D.M. et al., (1988) *The International Incidence of Childhood Cancer* IARC Scientific Publications no. 37. USA.
- PIKE M.C., et al. (1981) *The Epidemiology of Breast Cancer* Banbury Report no 8 Cold Springs, NY.
- PISANI S., SAMMUT V. et al., (1968) *Cancer of the Breast: A Local Study* Chestpiece, Malta.
- RAFFLE P.A.B. et al., (1987) *Hunter's Diseases of Occupations* Little, Brown & Company, Boston Toronto.
- ROSNER D., MARKOWITZ G., (1987) *Dying for Work: Worker's Safety and Health in Twentieth-Century America* Bloomington: Indiana University Press.
- SELIKIOFF I.J., (1978) *Asbestos Disease in US Shipyards* Mount Sinai Medical Centre NY.
- SHERWOOD L. GORBACH et al., (1984) *The Doctors Anti Breast Cancer Diet*. Simon & Schuster NY.
- SIGMUND E., (1980) *Rage Against Dying* Pluto Press London.
- TILLION G., (1983) *The Republic of Cousins* Al Saqi Books Press, London.