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THE POLITICS OF PUBLIC HEALTH: IDEOLOGY AND DISEASE CAUSALITY

University of Hawaii PH.D. 1980

THE POLITICS OF PUBLIC HEALTH

IDEOLOGY AND DISEASE CAUSALITY

A DISSERTATION SUBMITTED TO THE GRADUATE DIVISION OF THE
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ABSTRACT

This dissertation explores the relation between political beliefs and disease prevention, focusing primarily on a major disease-prevention institution, the U.S. Occupational Safety and Health Administration. It argues that the principal methods of disease prevention in a society are those which interfere least with economic production and conflict least with the society's dominant political ideology.

Chapter I distinguishes three current hypotheses which purport to account for the etiology of cancer and/or cardiovascular disease: a germ theory, a lifestyle theory and an environmental theory. Each of these beliefs about disease causality implies a different locus of responsibility for disease prevention. The idea that cancers are caused by micro-organisms confers responsibility on health professionals; the notion that an inappropriate lifestyle causes cancer and cardiovascular disease implies personal responsibility for disease control; and the belief that toxins in the environment cause these diseases places responsibility on the owners and managers of industry. Thus, the medical arguments surrounding these three theories are often masks for more fundamental political controversies over the proper organization of society.

This chapter argues that a reliance on either the germ or the lifestyle theory limits disease prevention programs but serves powerful economic interests. In contrast, the environmental approach to prevention of cancer and cardiovascular disease is the most effective method

to assure health but threatens these interests. The chapter also points out that a multifactorial theory of disease causality is both ineffective and biased against thsoe people most at risk of becoming ill.

Chapter II compares the current controversy over disease causality with a similar nineteenth century debate, arguing that Britain's Public Health Act of 1848 was passed not because of scientific certainty about disease causality but for political expediency. At that time contagionists and anticontagionists (environmental theorists) battled over the etiology of disease. Not enough scientific evidence could be mustered on either side to allow it to predominate but since the contagion theory demanded quarantine of ports as a means to control disease (a practice with serious economic consequences at the beginning of the Industrial Revolution), and sice the miasma theory implied a public policy which little interfered with industrial production, the environmental theory was enshrined in law with sanitary reform.

Chapters III and IV focus on the Hawaii OSHA Program, the Division of Occupational Safety and Health (DOSH). An investigation of DOSH via numerous interviews with agency personnel, workers, and others, reveals that the agency circumvents its implied radicalism, relying heavily on input from industrial interests in forming state occupational health programs and encouraging workers to embrace the lifestyle theory to prevent occupational disease.

Chapter V accounts for the hegemony of the germ and the lifestyle hypotheses by their congruence with American individualistic ideology. It argues that along with individualism goes a reification of the society and that prevalent among Americans is a notion that the society

exists separately from the people who comprise it. Such a concept makes it logical for people to sacrifice their health for the health of the economy and to believe, erroneously, that the benefits of their sacrifice are equally distributed among all people. As an illustration, the chapter describes how the sort of cost-benefit analysis currently in vogue condones social policies which benefit the few at the expense of the many. The chapter closes with a discussion of the ways that utilitarian attitudes and positivist science feed the same disregard for the lives of actual men and women.

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THE CURRENT DEBATE OVER DISEASE CAUSALITY

In which we learn that effective disease prevention depends on an environmental theory but that an environmental theory threatens a powerful group of people

Attempts at disease prevention are always based on assumptions about disease causality. In medieval Europe people tried to avoid plague by shutting themselves up in their homes, believing that plague is transmitted by the fomites of the sick. In the nineteenth century it was common practice to fight yellow fever by burning aromatic leaves in city streets, for people thought pestilential air caused the disease. During the same period many tried to deter cholera by avoiding the smell from cesspools and garbage heaps, thinking that the odor of filth carries disease. In Victorian England, upper-class men and women went to spas to soak themselves in water, a practice based on the notion that illnesses result from clogged pores. In many parts of the world today, people hope to protect themselves from various diseases by wearing amulets, for they see a connection between disease and evil.

All these forms of prevention--burning leaves, avoiding bad smells, taking baths and wearing amulets--have at one time or another been accompanied by a medical controversy over their efficacy. Some argued, for example, that plague is due to periodic atmospheric changes, and has nothing to do with contact among people. Later, many attributed yellow fever not to pestilential air but to the bodily emanations from the sick.

Cholera was thought by some medical authorities to come from contaminated food and clothing. The effectiveness of taking the waters was derided by those who believed all diseases are contagious. And many doctors doubt that amulets and other forms of psychic phenomena control disease, on the grounds that physical states have physical causes.

Underlying these medical disputes have been political arguments, for diseases are seldom separate from political institutions. When diseases strike mainly among a single social class, or accompany social or economic change, when they seem to have been brought to society by a group of newcomers or to result from socially-encouraged behavior, then controversies over their cause are also arguments about the organization of the larger society and statements about causality implicitly assign responsibility for disease prevention to some people and excuse others.

In the United States today, disease prevention programs to combat cardiovascular disease and cancer* are based on three competing hypotheses about the causes of these diseases. Some scientists argue that cancers are caused by microorganisms. Others claim that cancer and cardiovascular disease are due to an inappropriate lifestyle. Yet others argue that these diseases are due to toxins in the environment. Each of these three approaches to disease causality has far-reaching political as well as medical implications, for each implies a different locus of

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*According to the Vital Statistics of the United States, cardiovascular and cerebrovascular diseases--often considered as a single category--accounted for 37.8 and 10.3 percent, respectively, of the deaths in 1975 (a total of 48.1 percent). Cancer accounted for another 19.3 percent of total deaths that year. Other estimates vary slightly but are not significantly different (DHEW 1975:1-6).

responsibility for disease prevention. The germ theory confers responsibility on socially recognized experts, i.e., health professionals. The lifestyle hypothesis implies that responsibility is shared among individuals, their families and employers. And the environmental hypothesis places responsibility on the owners and managers of industry.

Other analysts of disease causality distinguish only two hypotheses about the cause of disease: a germ thery and an environmental theory (Dubos 1979; McKeown 1976; Knowles 1977). They include in the latter "tobacco, alcohol, radiation, occupation, drugs, [and] air pollutants" (Knowles 1977:64). But they use the word "environment" to embrace two radically different notions about disease causality, obscuring the fact that some hypotheses call only for personal change to prevent illness and others imply changes in industrial production. They thus overlook the political drama behind the medical questions. My purpose is to exhibit that drama by describing three major hypotheses which purport to account for cardiovascular disease and cancer and to discuss not only the medical controversies they raise but also the political implications inherent in each one.

I

Let us look first at the germ theory. This explanation for disease, holding that cancers are caused by viruses, has inspired a search for an oncogenic virus that dates back to the turn of the twentieth century. In 1911, Peyton Rous, working with chickens at the Rockefeller Institute, produced the first clear demonstration that viruses are implicated in malignant tumor formation, a discovery which won him a Nobel prize in

1966. In 1933, Richard Shope, also with the Rockefeller Institute isolated a tumor virus from rabbits, and three years later, J. J. Bittner discovered an oncogenic virus in rats with breast cancer. The excitement these discoveries generated--these and other researchers published some fifty papers on cancer viruses between 1911 and 1940--died down during the Second World War but in the early 1950s, the search for a viral etiology for cancer picked up again and a new generation of scientists has now published hundreds of papers linking viruses to cancers in mice, guinea pigs, monkeys, hamsters and frogs as well as in rabbits, fowl and rats.

In recent years DNA and RNA research on the structure of viruses in general has made important contributions to scientists' understanding of how oncogenic viruses work, thus adding to the expectation on the part both of some scientists and of the lay public that the secret of cancer causality in humans is about to be uncovered. The missing link in all of this work is the identification of a human cancer virus. Despite all the laboratory activity, no one has yet found a cancer virus in humans (Goodfield 1975, Andrewes 1970).

The hope, of course, is that the discovery of a human cancer virus would lead to the development of a preventive vaccine, like the justly-celebrated vaccine against polio. It might also help scientists in their search for a curative drug, thus ending the fear of cancer so prevalent in developed countries. The excitement surrounding research on interferon, a substance produced by the body which may aid cells to reject viruses, is based on this expectation.

Two disputes beleaguer cancer virus research, one a fairly straightforward medical dispute, the other a complex political controversy. The medical debate arises over what is known as the species barrier. Viruses --and bacteria as well--behave differently in different animals and one species' reaction to a given microorganism might not be repeated in any other species. Sometimes an animal serves as a healthy carrier for a microbe which causes disease or death in another species. Sometimes a bacteria or virus produces a mild illness in one kind of animal and a fatal one in another. This being the case, the applicability to humans of laboratory studies on animals is always questionable.

A second aspect of the medical debate revolves around the question of cancer transmission. If a virus is implicated, is cancer an infectious disease? Why is there no evidence that anyone has ever "caught" cancer from someone else?

* * * * *

Interesting as these medical questions are, they direct attention from more fundamental social issues inherent in the germ theory. The idea that diseases are caused by microscopic living creatures that can be passed from the sick to the well has engaged scientists since at least the sixteenth century, but it wasn't until the second half of the nineteenth century that anyone actually isolated and identified a disease-causing microbe (Rosen 1958:108-109). During the remarkable period of medical discoveries that began then, a host of virulent diseases, as well as some milder ones, were classified as infectious, i.e., caused by microorganisms.

The identification of particular microorganisms linked to specific diseases has made it possible to develop means of supplying the body with defences against their invasion. In some cases, predominately with viruses, this has meant injecting people with a vaccine which causes cells to manufacture antibodies against a specific microbe. In other cases, classically with bacteria, substances such as antibiotics have been developed to destroy a microorganism once it has begun to grow inside the body. So dramatic are these techniques that most people, including most physicians, give them credit for the freedom from infectious disease we know in industrial countries today.

The credit, however, is undeserved, for in Europe and North America the incidence of virtually all major infectious diseases began to fall several decades before the introduction of vaccines and antibiotics. In England and Wales, for example, the rate of children's deaths from scarlet fever, diptheria, whooping cough and measles, which had peaked at over 6,000 per million children, began a steady decline around 1860 and, just before the introduction of antibiotics in the 1930s, was down to less than one thousand per million (Powles 1973:7). Similarly, TB mortality, at 700 per 10,000 in 1812, had fallen to 370 per 10,000 in 1882 when the bacillus was first isolated and to 48 per 10,000 when antibiotics became routine after the Second World War (Illich 1976:5-6).

Thomas McKeown, whose careful studies of disease records in the eighteenth and nineteenth centuries uncovered much of this information, maintains that a rising standard of living--principally improved diet--was responsible for the reduction in disease (McKeown 1976). Thus the germ theory's current high status is based on questionable assumptions.

It appears that environmental factors, not germs, are the salient determinants of health and disease and that disease causality is far more complex than the germ theory implies.

People who nevertheless believe in the germ theory's ability to account for all disease can perhaps be excused for a lack of an historical perspective, but not for a blindness to the narrow applicability of the theory. Microorganisms have been implicated only in infectious diseases; scores of other ailments fall outside its scope. Consider the following list of diagnostic terms: hypertension, asthma, senility, malnutrition, alcoholism, hemophilia, concussion, emphysema, muscular dystrophy, lead poisoning, duodonal ulcer, gallstones, multiple sclerosis, coronary thrombosis, diabetes, and cirrhosis of the liver.

If the germ theory enjoys unwarranted prestige, that is not to say that viruses might not be found to play a role in cancer or even in cardiovascular disease. Remote as this possibility now appears, it would be outrageous to advocate abandoning cancer virus research. Could today's major diseases be eliminated without the personal change and economic upheavals other disease hypotheses implicitly call for, it would be welcome news, regardless of the desirability of change based on other criteria.

The very fact that other hypotheses link disease to factors typically held to be unrelated to health and disease goes a long way toward explaining the hegemony of the germ theory. It is reassuring to think of disease in the individualistic terms called up by the notion that it is caused by microorganisms. Diseases can be viewed as personal problems, and disease prevention can focus on the bodies of individual men, women

and children. This reductionist approach to disease can justifiably ignore people's intricate changing web of relationships to their environment, for it means that the real cause of disease, the fundamental cause, is tangible, identifiable and personal (Berliner and Salmon 1980, Turshen 1977). It sets up a causal chain with microorganisms as the immediate cause of disease, personal factors such as diet and stress as intermediate causes and environmental components like contaminated air or polluted water as tertiary causes.

Such a conceptualization makes it logical to think that the most efficient method of disease prevention is to provide the individual human body with a way to fight invasions of microorganisms, and to "move out" to advocate personal behavioral change only when no microorganism has been identified. Making environmental change would be, from this perspective, a last resort.

The germ theory encourages us to conceive of disease prevention as we might consider the more homely problem of preventing a lopsided wooden cup from falling off its shelf whenever anyone strides heavily across the room. We could reconstruct the entire house to make it more sturdy; we could build a new cup shelf in some manner to make it hold lopsided cups more securely; or we could simply sand down the cup's uneven side so it stands upright. Obviously, nobody rebuilds the house when sanding the cup will do. With such a chain of causality as a model, only the muddle-headed would advocate social and economic change to prevent disease when a change in body chemistry will do.

But the analogy of a human body with a cup implied by the germ theory is misleading. The cup exists separately from the house. It

can be taken out and used elsewhere; the cup is not affected by the house, nor is the house composed of cups. For people it is different. We humans are inseparable from our social environment. It is our creation; we respond to it; we are affected by it and we can change it. Without people there would be no society.

Thinking in terms of the germ theory and accepting the atomistic concept of human beings that it implies makes it logical to separate the Department of Health from the Department of Agriculture, for regardless of the impact of tobacco subsidies on health, for example, such an environmental cause of disease seems so far removed from the immediate cause of disease that it need be taken into account only theoretically. Similarly, the Department of Labor can be separate from the Department of Health, even though jobs and health are fundamentally connected.

Such institutional arrangements, brought about by the germ theory, reinforce it by affecting our thinking about the causes of disease. Murray Edelman neatly points this out:

> Consider the political implications of our conventional mode of naming and classifying the most common social "problems": poverty, crime, mental illness, occupational illness, drug abuse, and inadequate education. We establish separate departments of government to deal with these supposedly distinct problems (departments of welfare, criminal justice, education, health, for example), and staff them with people trained to focus upon a particular set of symptoms and to believe in a distinctive set of causes for each of them. Such a classification evokes beliefs and perceptions that we normally accept uncritically, precisely because they are generated subtly by the terms used to designate them. The classification scheme implies, first, that these various problems are distinct from one another, with different causes, just as they have separate symptoms.
>
> A considerable body of research suggests that this premise is simplistic and distorting because all of these problems can be seen as flowing largely from the functioning of economic

> institutions. If economic institutions functioned without unemployment, poorly paid work, degrading work, or inadequate industrial pension and health programs, there would manifestly be very little poverty. Is poverty, then, a problem of "welfare" policy or of economic institutions? Contradictory cognitions are available for use; those who accept the research pointing to the second view conclude that to blame the problems of the poor on welfare policy is to confuse the symptom with the cause. (Edelman 1977:26-27)

Not only do institutional arrangements affect our thinking but, more significantly, they affect our health directly. We can see this most clearly, perhaps, by considering the persistence of infectious diseases in the Third World. The germ theory, focusing on the role of microorganisms, suggests that innoculations should be the primary disease prevention measure. The prospect of fighting disease by changing agricultural policies which have substituted cash crops for food, or development policies which depend on a supply of underpaid laborers, would not likely enter into discussions of disease control. Government agencies for agriculture and development are seen as having little responsibility for health even when these policies make people sick. These government agency divisions are not politically neutral; they are not mere organizational conveniences. They serve the interest of some people to the detriment of others. In the Third World they carry out policies which sacrifice the health of the poor to the pocketbook of the rich.

This criticism of the germ theory should not be construed as a condemnation of it. The discovery of microorganisms has brought immeasurable benefit to humankind, and continued biomedical research promises even further release from the bonds of disease. It must be recognized however that the germ theory is more directly applicable to the treatment and cure of diseases than it is to their prevention and

that the chain of causality it calls up can be held responsible for severely limiting efforts to prevent increases in both infectious and chronic illnesses.

II

The second hypothesis about disease causality holds that cardiovascular disease and cancer are caused by an unhealthy lifestyle. It shifts to the forefront the personal behavior factors which from the perspective of the germ theory are only secondary contributors to disease. Stress, lack of exercise, the use of alcohol and tobacco, and improper nutrition receive the blame for most chronic disease. Lifestyle theorists reject the notion, central to the germ theory, that a single disease has a single etiology. Instead they emphasize the interrelatedness of many factors in disease causality, principally those under the control of the individual. Nevertheless, this approach to disease resembles the germ theory for it still conceives of diseases as a personal event taking place within the individual human body.

The most influential proponent of the lifestyle hypothesis is the U.S. Department of Health and Human Services (formerly HEW). The Surgeon General's 1979 report on health promotion and disease prevention, Healthy People, describes fifteen "Actions for Health," only two directed at reducing toxins in the environment and five at changing individual behavior. The Report urges "smoking cessation," "reducing misuse of alcohol and drugs," "improved nutrition," "exercise and fitness" and "stress control" (DHEW 1979:119-135). Perhaps reflecting controversy about these disease prevention methods, the other eight Actions are not aimed

at chronic disease at all, despite the Report's appraisal that "75% of all deaths in this country are due to degenerative diseases such as heart disease, stroke and cancer" (p. 3). Instead they concern themselves with birth control, pregnancy, immunizations, venereal disease, accidents and the like.

Another influential proponent of the lifestyle theory, John Knowles, president of the Rockefeller Foundation, took the editorial page of Science to explain that

> [p]revention of disease means forsaking the bad habits which many people enjoy--overeating, too much drinking, taking pills, staying up at night, engaging in promiscuous sex, driving too fast, and smoking cigarettes--or put another way, it means doing things that require special effort--exercising regularly, improving nutrition, going to the dentist, practicing contraception, ensuring harmonious family life, submitting to screening examinations. (Knowles 1977a:1103)

Lifestyle theorists have run into trouble labeling their approach to disease prevention. Originally many were enamored of the term "environmental" but they soon realized that in using it they risked being included among those who think chemical toxins and radiation are major factors in disease causality. Such a lifestyle theorist is John Higgenson, founder of the World Health Organization's International Agency for Research on Cancer. His estimate that 80-90 percent of all cancers are "environmental" has been widely quoted, and, he says, widely misunderstood. In an interview last year with Science he denied the interpretation that environmental toxins play a major role in cancer. "From an epidemiological viewpoint," he says, "I believe that attempts to prevent most tumors through control of mutagens and carcinogens will prove to be a disappointing approach . . ." He went on to assert that smoking, diet and "behavior" are the most important causes of disease. An "overemphasis

on chemical carcinogens has distorted our approach," he said. "To make cancer the whipping boy for every environmental evil may prevent effective action when it does matter, as with cigarettes" (Science, Vol. 25, 28 Sept. 1979:1363-1366).

Other proponents of the lifestyle hypothesis make the point more subtly. The chairman of the board of the American Cyanamid Company writes:

> While an understanding of the true nature of cancer still eludes us, today there is growing acceptance that 60-90% or all cancer is related to "environmental" factors such as the ultraviolet radiation in sunlight, diet, smoking, the use of alcohol and other lifestyle causes. Some carcinogens occur naturally in food. (Afflect 1978:20)

The Dow Chemical Company goes even further. In its twenty-four page booklet called A Challenge to Fear (The Facts About Cancer in the U.S.A.) it claims that the quality of our air and water is fixed and unaffected by human activity.

> Most of us assume that the environment is an area over which we have little or no control--it's comprised of water, air, grass and trees, as well as that mysterious stratosphere of particles and gasses that surrounds our earthly planet.

That paragraph is immediately followed by another which picks up the lifestylists' theme that disease can be reduced by personal behavior change.

> Surprisingly, "environmental factors" as causes of cancer are things we would recognize more readily if they were defined as "life-style" or "habits." And, these things are ones over which we have a great deal of individual control. (Dow Chemical 1978)

Proponents of the lifestyle hypothesis do not hesitate to connect their recommendations for disease control to the escalating cost of health care. Canada's famous 1974 report entitled "A New Perspective on the

Health of Canadians" usually referred to as the Lalonde Report after former Minister of Health Marc Lalonde, has served U.S. health analysts as a model. The best way to combat the high cost of medicine, the report says, is to get people to change unhealthy personal behavior. The report inspired a series of health-promotion programs in Canada, chief among them Operation Lifestyle, emphasizing exercises, diet, reduction of alcohol consumptions and such safety-conscious programs as mandatory seat belts (Vayda 1978).

Lalonde's theme is picked up by Bruce Stokes, of the Worldwatch Institute who writes, again is an editorial for Science,

> Even though this is the richest nation in the world, the average American family . . . cannot afford to be ill. President Carter and Senator Edward Kennedy have both proposed national health insurance plans . . . But as the debate over these multibillion-dollar plans heats up, the nation risks losing sight of the fact that one of the cheapest and most effective ways to put a cap on spiraling health care costs is through greater self-care. (Stokes 1979: 547)

However sensitive he may be to economic issues, Stokes is out of touch on health education. The nation is bombarded with information about self-care. Newspapers and magazine articles, paid advertisements by industry, health group literature, lectures, television programs and a number of popular books relay the message: your lifestyle is making you sick.

A major portion of the message concerns nutrition. The American Cancer Society claims that 59 percent of cancer in men and 30 percent in women is caused by dietary factors (Wynder 1979) and the National Cancer Institute announced in October 1979 that both cancer and cardiovascular disease are due to a diet too low in fiber and too high in fats.

Evidence for the role of fat and fiber in disease comes from epidemiological investigations which suggest that varying cancer rates among different cultural groups can be tied primarily to differences in fiber and fat consumption. We are urged to cut down on dairy products and fatty meat and to consume greater quantities of root vegetables, bran, seeds and nuts (Burkitt 1978).

Besides fibers and fats, proponents of the lifestyle hypothesis connect chronic disease to refined sugar and flour, too much salt, meat itself (Winikoff 1978) and to a new category of food called "junk food," distinguished from "natural" or "health" food in esoteric ways. (The distinction is similar to that between "hot" and "cold" foods in many traditional societies. By and large junk foods are either very sweet or very salty or they are available, from stores or restaurants, with a minimum of preparation or waiting. Exceptions, however, abound.)

A second portion of the lifestyle hypothesis concerns the degree to which stress causes disease. Some physicians consider stress an intermediary factor in disease and expect that its reduction can "free energy needed by the defense and immune system to eliminate cancer cells and permit exhausted adrenal glands to return to their normal function" (Fiore 1979:288). Others are not sure of a causal relation between stress and disease but do emphasize their association. "The onset of illness, both physical and psychiatric, has been shown to be preceded by a significant increase in stress . . ." (Andrews et al. 1978:27). Still others claim that stress is the direct cause of some illnesses. The chief of medicine at Harvard's Peter Bent Brigham Hospital, Eugene Braunwald, told the American Heart Association last year that

"circumstantial evidence is very powerful that psychological experiences can trigger [heart attacks]." University of Nebraska researchers agreed, saying that cardiovascular strain arises from the mind rather than from the body ([UPI] Honolulu Advertiser 11/16/79).

To teach people how to reduce stress in their lives, as well as how to exercise and what to eat, a number of Wellness Clinics or Healthing Centers have sprung up around the country in recent years, sometimes under the auspices of a hospital or medical center. For a fee, clients attend regular sessions where physicians, psychiatrists, nutritionists and "exercise therapists" guide them in behavioral and dietary change.

Such clinics form part of the holistic health movement, an approach to health stemming from a disillusionment with traditional curative medicine. Noting that if childhood mortality is excluded, life expectancy in industrial countries has barely changed since 1900 (HEW 1979, Figures 3A, 4A, 5A, 6A, and 7A), that contact with doctors can result in more illness than less (Illich 1976), and that medical care has only an insignificant role in improving health (Carlson 1975), the holistic health movement promotes techniques for health maintenance which eschew pharmaceutical and surgical intervention.

The emphasis on the whole body is part of a larger concern central to the lifestyle hypothesis. Much of this approach to disease prevention seeks to understand the perplexing relation between the physical and the mental and to break down the mind-body dualism characteristic of Western civilization. It derives strength from traditional cultures and from Eastern religions which affirm harmony between human beings and their

environment, a one-ness with nature and a "philosophical view of health as equilibrium" (Dubos 1979:118).

Somewhat different from holism--for it is founded on science instead of on mysticism and thus can claim more cultural validity--is the tobacco smoking component of the lifestyle hypothesis. Scientists have linked smoking to lung cancer since at least the 1950s and more recently to cancer of the mouth, larnyx, esophagus, pancreas, kidneys and bladder. More significantly, they find that smoking increases the risk of heart attacks (Wynder and Hoffman 1979). The 1979 Report of the Advisory Committee on Smoking and Health to the Surgeon General notes that over all, smokers have "an approximately 70 percent greater chance of dying from disease than non-smokers." The chief contributor to the excess mortality is coronary heart disease, followed by lung cancer and obstructive lung disease (DHEW 1979). The total economic cost of smoking (medical care plus lost earnings) is estimated to be $27.5 billion per year. If the even greater estimate of the cost of alcohol consumption ($44.2 billion/year) is added to that, these two activities account for 25 percent of the consumer costs of all illnesses (Luce and Schweitzer 1978).

* * * * *

Like the germ theory a variety of medical arguments surround the notion that an unhealthy lifestyle accounts for disease. First, the role of diet in disease causality is, at best, disputed. When the National Cancer Institute announced that a low fiber, high fat diet may

cause cancer, Arthur Upton, NCI director, is reported to have called the recommendations only "prudent interim principles," or "tentative" guides in a field in which "the exact role that diet plays remains unclear" ([Washington Post Service] Honolulu Advertiser 11/3/79).

That the cholesterol in dairy products and meats is actually causally related to heart disease was challenged in a seminal article in the prestigious New England Journal of Medicine in September 1977 by George Mann of the Vanderbilt University School of Medicine.

> A generation of research on the diet-heart question [wrote Dr. Mann] has ended in disarray. The official line since 1950 for management of the epidemic of coronary heart disease has been a dietary treatment. Foundations, scientists and the media, both lay and scientific, have promoted low fat, low cholesterol polyunsaturated diet, and yet the epidemic continues unabated, cholesteremia in the population is unchanged and clinicians are unconvinced of efficacy . . . One of the originators of the diet-heart hypothesis, E. H. Ahrens, Jr., wrote in 1969 and has restated in recent Congressional testimony, "It is not proven that dietary modification can prevent arteriosclerotic heart disease in man." (Mann 1977:644)

Whether stress is a direct or indirect cause of disease is also, as mentioned above, debated. It is not, in fact, clear what stress is; the concept tends to slip away from a direct gaze. The authors of Healthy People wrote ". . . when stress--or an individual's reaction to it--is excessive, physiological change can be so dramatic as to have serious physical and emotional consequences" (HEW 1979:135) thus begging the question of whether stress is located inside or outside the body. Similarly, we need to know if stress causes the "phyisiological change" which has "physical and emotional consequences" or if stress is the physiological changes themselves. Before blaming disease on stress, scientists need to define it more sharply.

Exercise and physical fitness may prevent disease, and then again they may not. Healthy People admits they are only "attractive and plausible" in the role of preventing disease (HEW 1979:133) while at the same time claiming that "regular, vigorous exercise was found [in a study of Harvard alumni] to reduce risk of heart attack independent of other risk factors such as cigarette smoking or high blood pressure" (p. 133).

The role of smoking in disease causality is also challenged. Sterling reports on a dozen studies of asbestos, coke oven, copper and uranium workers which all suggest that these individuals' exposures to occupational carcinogens, not their smoking, caused their cancer (Sterling 1978). Pointing out that "human-type lung cancer has never been produced in any animals by use of tobacco smoke" (p. 448), he questions the conventional interpretation of smoking studies and concludes that "the relation between smoking, occupation and disease needs serious clarification" (p. 450).

Indeed the entire notion that lifestyle is a significant factor in disease causality is challenged in Work in America, the 1973 Report of a Special Task Force to the Secretary of Health, Education and Welfare. Research findings, the report notes, suggest that such things as diet, exercise, smoking, medical care, job satisfaction and blood pressure "may account for only about 25% of the risk factors in heart disease, the major cause of death" (HEW 1973:79).

* * * * *

Obviously, the lifestyle hypothesis approaches disease as though ill health is the result of personal failures. It dismisses with a wave of a hand most environmental toxins and it ignores the crucial connection between individual behavior and social norms and rewards. It is, in fact, a victim-blaming approach to disease. As Howard Berliner points out, "Discussing changes in lifestyle without first discussing the changes in the social conditions which give rise to them, without recognizing that lifestyle is derivative . . . is misleading . . ." (Berliner 1977:119).

Harvard Medical School's Leon Eisenberg argues the issue in the New England Journal of Medicine:

> The new converts to prevention, having discovered that behavior affects health, focus on the responsibility of the individual for illness prevention by eating and drinking in moderation, exercising properly, not smoking and the like. Surely, in the final analysis, it is the individual who carries out these actions. But what does it mean to hold the individual responsible for smoking when the government subsidizes tobacco farming, permits tax deductions for cigarette advertising and fails to use its taxing power as a disincentive to smoking? What does it mean to castigate the individual for poor eating habits when the public is inundated by advertisements for "empty-calorie" fast foods and is reinforced in present patterns of consumption by federal farm policy? (Eisenberg 1977:1231)

The notion of victim-blaming derives from William Ryan's influential book first published in 1971. In it he argues that social problems such as slum housing, poverty, and many diseases are rooted in the structure of American society and can only be eliminated by fundamental political and economic changes. Most current attempts to remedy social ills fail, he says, because their focus--on individual people--illuminates the symptoms, not the causes of the problem. As an example, he cites childhood lead poisoning, a problem in slum housing when children ingest bits of now-illegal lead paint chips from poorly re-painted walls.

> A major pharmaceutical manufacturer, as an act of humanitarian concern, has distributed copies of a large poster warning "LEAD PAINT CAN KILL!" The poster, featuring a photograph of the face of a charming little girl, goes on to explain that if children eat lead paint, it can poison them, they can develop serious symptoms, suffer permanent brain damage, even die. . . .
>
> Now, no one would argue against the idea that it is important to spread knowledge about the danger of eating paint in order that parents might act to forestall their children from doing so. But to campaign against lead paint only in these terms is destructive and misleading . . .
>
> The cause of the poisoning is the lead in the paint on the walls of the apartment in which the children live. The presence of the lead is illegal. To use lead paint in a residence is illegal; to permit lead paint to be exposed in a residence is illegal. . . . To ignore these continued and repeated law violations, to ignore the fact that the supposed law enforcer actually cooperates in lawbreaking, and then to load a burden of guilt on the mother of a dead or dangerously-ill child is an egregious distortion of reality. And to do so under the guise of public-spirited and humanitarian service to the community is intolerable. (Ryan 1972:23-24, emphasis in original)

Employing a similar analysis, Howard Berliner argues that while people may be able to avoid heart attacks by changing their behavior, a failure to do so is more than stubbornness, ignorance or sloth.

> One of the strongest risk factors in heart disease is behavioral pattern. Type-A behavior--competitive, aggressive, always rushing around--has been identified as a strong predictor of heart attack. Type-B behavior, the polar opposite--cooperative, easy going, passive, relaxed--has little chance, other things being equal, of having a heart attack. The chance of a Type-A behavior person having a heart attack is between two and five times greater than the chances of a Type-B behavior person. Clearly, then, it is in the interests of the individual to try to take on a Type-B behavior--to be easy going and cooperative. But it is clearly in the interests of capitalism that people maintain Type-A behavior, and this is the behavior type that bourgeois reproduction and socialization mechanisms foster and which defines the bourgeois ideal of success. Clearly a contradiction exists within the system in that what is healthy for the economic system is lethal for the individual. (Berliner 1977:119-120)

Empirical evidence to bolster the claims of these critics comes from the age-old correlation between low social class and high disease

rate, a correlation which continues today. The best study detailing this relation is Occupational Mortality by the British Office of Population Censuses and Surveys, which, for the last century has regularly compiled data comparing mortality and social class (as determined by occupation). The most recent publication shows that whatever measure of mortality is used, people in the upper classes live longer than those in the lower (OPCS 1970-72).

Studies in the U.S. show similar correlations. Yeracaris and Kim concluded from a comparison of death rates in Birmingham, Buffalo and Indianapolis that the "highest rates from the three selected causes of death were found in the lowest SE [socioeconomic] groups in the cities and the lowest rates in the two highest SE groups in the suburbs" (Yeracaris and Kim 1978:350). In another study Patrick Conover presents data by race showing "a clear and strong relationship between income level and experience of selected chronic diseases" (Conover 1973:367-368). And Vicente Navarro shows that the infant mortality rate and the death rate from tuberculosis and accidents are significantly higher in rural Appalachia than in the highest-income urban states (Navarro 1976:68-69).

As Veatch remarks in the Journal of the American Medical Association, "If it is the case that for virtually every disease, those who are the poorest, those who are in the lowest socioeconomic classes, are at the greatest risk, then there is a piously evasive quality to proposals that insist on individuals changing their life-styles to improve their positions and their health potential" (Veatch 1980).

None of the critics of the lifestyle hypothesis argues that standard health education programs should be abolished. Nor do they mean that people have no responsibility for maintaining their health. Their point is that it is both immoral ("victim blaming") and ineffective to limit disease prevention programs to lifestyle intervention. Certainly the ineffectiveness is well documented, particularly for smoking. Despite all the health education in recent years about the dangers of smoking, some 4,000 children and adolescents become cigarette smokers each day (DHEW 1979:123). By 1974, 20 percent of 15-16 year old girls were smokers, up from 10 percent in 1968 (Wynder and Hoffman 1979:894). Although smoking among men has decreased considerably in recent years, the percent of women smoking has fallen off only slightly (DHEW 1979:122). Similarly, the burgeoning fast food business belies any claims that Americans are changing their diet to nuts and grains. And physicians trying to bring about lifestyle changes among their patients report meager results (Syme 1978; and personal communication from T. Cashman, head of Honolulu's Wellness Clinic). More significantly, they point out that the lifestyle hypothesis is a victim-blaming hypothesis because lifestyle is linked to underlying social forces and is thereby inextricably intertwined with the rewards and expectations of society (Crawford 1977:675-677).

III

The third hypothesis about disease causality even more significantly challenges the chain of causality implied by the germ theory. It holds that chronic diseases are directly caused by toxins in the environment

thus forcing its proponents to connect disease to industrial production. It is a frankly political position. Medical evidence supporting this hypothesis falls into three categories.

In the first are occupational carcinogens and other toxins. In 1979 the Department of Health, Education and Welfare announced that at least 20 percent of all cancers are occupational, raising considerably its previous estimate of 5 percent. The best-known occupational toxin is asbestos, some 600,000 tons of which are used annually in the U.S. At least 1.4 million workers are now exposed to asbestos in their work (NIOSH news conference reported in the Honolulu Advertiser, 4/18/80) and between eight and eleven million workers have been exposed since World War II (Epstein 1978:79). HEW estimates that 58,000 to 78,000 of these men and women will die "excess deaths" each year, the largest number from lung cancer, a smaller number from abdominal and chest malignancies, and still others from asbestosis, a respiratory disease caused by scarring of the lungs (HEW Physician Advisory Bulletin, 4/25/78). But asbestos is by no means the only occupational hazard.

An estimated 50,000 workers are exposed to benzene on their jobs, over half of them without the benefit either of engineering controls or protective equipment (Epstein 1978:123). Benzene, one of the twelve most used chemicals in the U.S., is a bone marrow depressant, causing aplastic anaemia, leukemia and chromosomal damage. Major exposures occur in petroleum and petrochemical refineries, chemical plants (principally those making rubber products and solvents) and in the steel industry. Less frequent, but still significant dangers are faced by printing pressmen, lithographers, shoemakers, gasoline pump attendants, and producers of ink, paints and varnish, to name but a few.

A growing list of other chemical compounds have been found to cause cancers in workers in dozens of other occupations. U.S. industries use some 28,000 toxic chemicals, 2,200 of them suspected carcinogens (Smith 1979). Estimates of the number of new chemicals with unknown health effects introduced into industry each year go as high as 1,000 (Culleton 1978).

In addition to causing cancers some occupational toxins are implicated in heart disease. Toxins that cause respiratory illnesses can exacerbate heart disease, because of the strain on the heart from years of pumping blood through inelastic lung tissues. Furthermore, there is some evidence that carbon disulfide and carbon monoxide, found in some industrial sites, may speed up the natural formation of cholesterol plaques in the arteries, thus playing a role in coronary arteriosclerosis (Stellman and Daum 1973:30-33).

Workers in other hazardous environments include uranium workers, some 6,000 of whom are expected to get cancer in the next twenty years (Stellman and Daum 1973:xiv), coalminers, people exposed to cotton dust, agricultural workers, welders, coke oven attendants, sewer workers, barbers and hairdressers, carpenters, textile printers, drug makers, dry cleaners, rubber workers, electrical workers, oil processors, and metal workers (Stellman and Daum 1973:368-419). In fact, the majority of blue collar workers, and many white collar workers as well, spend many hours each day in environments where chemical fumes, dusts, mists and vapors may endanger their health.

Next in the environmental toxin category are dangerous substances in the air and water from such things as chemical wastes, radiation, industrial plant smoke and pesticides.

According to the Envrionmental Protection Agency, private industry and the military generate some forty million tons of hazardous wastes a year, 50 percent of which may be improperly disposed ([Newsday]-Star Bulletin and Advertiser, 6/10/79). About 30,000 hazardous waste dumps exist in the U.S. ([Washington Post Service] Honolulu Advertiser, 10/26/79) increasingly reported as consisting of leaking or rusting containers and shifting landfill.

Some of these wastes are radioactive. The EPA estimates that by the year 2000 commercial nuclear reactors will have generated 100,000 metric tons of spent atomic fuel and one billion cubic feet of low level wastes (Critical Mass Journal, 1980). No one knows how or where these carcinogenic materials can safely be stored.

No one knows either what the effects will be on the estimated five million current and past employees at U.S. nuclear installations who have been exposed to low level radiation ([Washington Post Service] Honolulu Advertiser, 1/29/79). In Germany a 1979 study revealed that since 1977 accidents in nuclear power plants have occurred there at the rate of one every three days (Höpfer 1979:418). Low level radiation, now estimated by the National Academy of Sciences to account for 5 percent of all cancers, endangers not only nuclear plant workers but people who receive even routine X-rays ([U.S. News and World Report] Honolulu Advertiser, 5/13/79) and the "hundreds of thousands of persons [who] received radiation exposure during government nuclear tests in the Southwest during the 1940s" ([Washington Post Service] Honolulu Advertiser, 1/29/79).

In addition to chemical wastes and radiation, the air and water can be contaminated by pesticides. According to an ERA estimate one-third of the 1,500 active ingredients in registered pesticides are toxic and one-fourth are carcinogenic (Smith 1979:28-32). These pesticides are often highly volatile, escaping into the air and water in agricultural communities and sometimes leaving residues in the soil for years after application. They accumulate and concentrate in the food chain and can be recovered later in dairy products, meat, poultry and fish (Epstein 1978:239-270).

Epidemiological surveys have found excessively high cancer levels among people who live near manufacturing centers where smoke from industrial plants (especially petrochemical plants) contaminates the air. "Cancer maps" printed by the Department of Health, Education and Welfare demonstrate the growing danger of living in New Jersey, Washington, D.C., Rhode Island, New York and Connecticut. People in these states have a combined death rate from cancer that is 38 percent (for females) and 45 percent (for males) greater than for people living in the five states with the lowest cancer rates (Epstein 1978:25-26).

Along with occupational hazards and toxins in the air and water, additives to food may also be dangerous. The U.S. House Committee Subcommittee on Oversight and Investigations reports that "virtually all food contains residues of synthetic substances that have been developed in recent decades. Scores of these chemicals have been linked to cancer, birth defects and permanent genetic mutations. Still others have never been tested for safety" ([quoted in L.A. Times Service] Honolulu Advertiser, 12/19/78). There are some 3,000 direct additives in our food (i.e., preservatives, flavorings, stabilizers and colors)

and 10,000 indirect additives (chemicals connected with processing, packing and storing) plus an unknown number of additional environmental contaminants (Hutt 1978:56).

The question of food and cancer has focused attention on saccharine in recent years. Seven million pounds of artificial sweetener were added to food, principally diet sodas, in 1976 (Epstein 1978:190) and its manufacture has not lessened in the years since. In 1977 a Canadian study demonstrated a correlation between saccharine and both bladder cancers and breast cancers in laboratory animals. And in the U.S., a National Cancer Institute study in 1978-79 showed a 60 percent increased risk of bladder cancer among men who were "heavy users" of saccharine. "Women who consume diet drink or sugar substitutes twice or more daily have a 60 percent greater risk of developing bladder cancer than do other women, although their risk is still less than men" ([Washington Post Service] Honolulu Advertiser 12/21/79).

A host of other reports raise questions about the presence of carcinogens in the environment:

√ University of Texas scientists suggest that a chemical in office copy machines may cause cancer (Honolulu Advertiser, 4/14/80)

√ The Consumer Product Safety Council says that formaldehyde, commonly used in plastic products, causes cancer (Honolulu Advertiser, 10/18/75)

√ A National Science Foundation-funded study shows that nitrosamines, an extremely potent carcinogen, contaminate some kinds of beer and whiskey (Nature, Vol. 280, 23 Aug 1979:623).

√ Asbestos, routinely used in the construction of schools between 1956 and 1973, has recently begun to deteriorate, exposing millions of schoolchildren to this known carcinogen (Spooner 1979:782-784).

While it is an overstatement to say that one can't pick up the paper without reading that some new substance is carcinogenic, evidence mounts that the things we produce and the ways we produce them cause disease.

* * * * *

Two significant scientific disputes surround the environmental toxin hypothesis. The first concerns the suitability of extrapolating from animal studies to human beings. Some scientists claim that a distinction can be made between chemicals toxic to humans and those toxic to animals, much like the case of microorganisms. "Individual agents can produce different tumors in different species or only in certain species," writes a deputy director of the National Cancer Institute, so "different agents may be carcinogenic for certain species or particular organs but relatively harmless for others, for reasons that are not yet apparent to science" (Gori 1980:258).

Other scientists disagree. Richard R. Bates of the National Institute of Environmental Health Services (NIEHS) writes that it is appropriate to

> rely on experimental studies with animals as a base for judging the potential carcinogenicity of a chemical for human beings. The practice is supported by the observation that most known human carcinogens are also carcinogenic in experimental animals, that for the most part the same kind of metabolic enzymes that activate and detoxify chemical carcinogens are present in both human and animal tissues and in experimental animals and that the general process of development of similar kinds of cancer is comparable in human and experimental animals. (Bates 1979:306)

About this issue Arthur Upton, director of the National Cancer Institute says, "Unfortunately, the science of the matter is not cut and dry [sic]. There are honest scientific differences of opinion about evidence and how one can interpret it" (quoted in Hutt 1979:467).

Confusing the inference from animal to human cancers is the undisputed knowledge that in nature cancer has a long latency period. Usually twenty to thirty years pass between the time a person is exposed to a carcinogen and the time he or she gets cancer, so even though controlled animal studies prove that a given chemical induces a particular cancer, in human cancers the cause and effect relationship is subject to controversy.

The second medical debate revolves around the concept of threshold levels. It may or it may not be possible to determine levels of exposure to a known carcinogen below which people are not in danger of getting cancer. Since the Occupational Safety and Health Administration sets precise permissible exposure levels for carcinogens, this agency implicitly affirms that threshold levels (TLVs) can be determined. However, Eula Bingham, the agency's director argues that there is no evidence that a threshold level exists for any carcinogen (Dickson 1978:261). Her position is echoed by Samuel Epstein in a paper delivered to the International Agency for Research on Cancer. "[N]umerous expert national and international committees and bodies have unanimously attested to the fact that there is no mechanism for determining the existence of biological thresholds for chemical carcinogens and hence the TLV concept is totally inapplicable to chemical carcinogens" (Epstein 1976:393).

The American Industrial Hygiene Council disagrees. Its president, Dr. Hoerger, who is also associated with Dow Chemical, says, "No-effect levels have been repeatedly demonstrated for carcinogens in animals and man" (Dickson 1978:261) and Dr. Gori of NCI says that the presence of TLVs is "suggested by much evidence which parallels universally accepted concepts in chemistry, physiology and pharmacology" (Gori 1980:259).

Richard Bates of the NIEHS suggests that some of the controversy over TLVs results from a confusion over whether the term is applied to populations or individuals but he concludes that "we are still in a position of being unable to unequivocally decide whether or not thresholds exist, as defined at the molecular or population level . . . " (Bates 1976:307).

(Another argument about environmental toxin research, frequently heard among the general public, is that cancer laboratory studies are all suspect because any substance given in high enough concentration causes cancer. This argument is not taken seriously by scientists. Only a small percentage of suspected toxins are shown to be carcinogenic to laboratory animals, regardless of how high a dosage is administered (Epstein 1977:29; Wolfe 1980:1).

* * * * *

These medical issues would not engage us, nor would they elicit such passion from scientists were it not for the political issues which underlie them. The environmental hypothesis points to industrial production as the cause of disease and forces its proponents to the conclusion that ot have a healthy population changes must be made in the

economy. In other words, the environmental hypothesis manifests its political nature for all to see, in marked contrast to the germ theory and the lifestyle theory which, although as "political" as the environmental theory, appear to be politically neutral because they do not challenge the status quo.

As long as the cause for a disease can be located in isolated microorganisms or in individual human beings, disease is a private event. Assigning a causal role to phenomena outside the human body makes disease political. In fact, much of what we label "politics" is the ongoing debate over what is private and personal and what is public and political.

For example, the question at the core of the women's movement is whether the low status of women is a private phenomena caused by women's inherent characteristics, or a political phenomena caused by society's attitude toward women. In the former conceptualization women's position will be changed when women themselves behave differently; in the latter conceptualization, women's position will be changed by eliminating sexism in laws, language, advertising and other social practices. Similarly, the political response to an issue like crime in the streets depends on whether robbery, muggings and rape are thought to be caused by the evil characteristics of the lawbreakers or by phenomena in the larger society such as poverty.

Just as for crime and the unequal status of women, if disease is defined as socially caused, then its elimination demands social change. The idea threatens those who embrace the extant arrangement of wealth and power. Thus the political argument behind the environmental

hypothesis of disease causality concerns the role of industry in American society and the extent to which we all benefit from industrial production.

The contents and ramifications of the argument form the subject of Chapter V. Here it need only be noted that in their fight against the environmental hypothesis industrialists have an ally in the still-vibrant American belief that ours is a classless society.

* * * * *

Reconciliatory-minded people, lamenting the divisive result of arguments over causality frequently subscribe to the seemingly non-polemical position that the cause of these untoward phenomena is "multifactorial." In the case of disease this position holds that a person's illness cannot be traced simply to one cause. Even in infectious diseases like cholera for which a microorganism has been identified, personal susceptibility factors play a role in whether one becomes ill upon ingesting the bacillis, and social factors determine whether there are cholera bacilli in the environment in the first place. In the case of the "more complex" chronic diseases, such as cancer of the lung, this conceptualization of causality seems at first particularly appropriate. Distinguishing three theories about cause appears to be a purely academic exercise because conscientious public health programs recognize disease as multicausal and operate on all fronts at once.

The trouble with this description is not only that it doesn't reflect reality--public health programs definitely do not expend equal resources on all causal theories--but we don't even want such a reality.

Take the case of cholera. Were we suddenly to learn that the cholera organism contaminates our water supply, few citizens would advocate dividing public resources equally among a program to innoculate the population against cholera, another program to administer a health education campaign to teach people the best way to boil water (and how to bathe, brush their teeth and swim without ingesting any) and a third to purify the water at its source. Instead, most people would expect that first priority go to ensuring that they get pure water when they turn on the tap. (Then, of course, there would be no need for public education programs or mass innoculations.) Even in the case of yellow fever--a disease unlike cholera in that a really effective vaccine exists--we want a mosquito-eradication program aimed at the environment, not a health education program aimed at the people.

To treat all hypotheses about disease causality as though they were essentially alike, merely different facets of a large "multifactorial" cause, is to divert disease prevention funds from effective but socially disruptive activities to less effective but non-disruptive plans without public discussion on these options. It allows the Department of Health and Human Services--to take an influential example--to warn about environmental toxins as a cause of disease while advocating lifestyle changes as the means of prevention. Their publication Healthy People is paradigmatic of its practice. The Occupational Safety and Health Administration uses a similar strategy as will be seen in Chapter IV.

A major rationale for the multicausal approach to disease prevention is that it is too risky to put all one's eggs in the same basket

when science is unsure. In the face of scientific debate about the causes of disease, politicians should practice caution. This appeal rests on the assumption that scientific "facts" are easily recognized as such and that they are promptly transformed into action. Perhaps proponents of this view have in mind the isolation of the polio virus and consequent development of immunization programs. They ignore the information that numerous fatal disease, not only polio but yellow fever, plague, cholera, dengue and typhus are still endemic in most of the Third World today although the microorganismic cause of these diseases has long been known by science. They do not know, perhaps, that the much-touted eradication of smallpox in the 1970s took over 150 years from the time of the introduction of vaccination to the last appearance of the disease,* and that the toxicity of asbestos had been so well established by 1918 that U.S. and Canada insurance companies refused to insure asbestos workers (Epstein 1978:83-84).

More significantly, the appeal to caution evades a central political question: For whom is it too risky to put all the eggs in one basket when science is unsure? "If there is room for scientists to debate," demands Molly Joel Coye, "why are workers exposed in the interim? They are endangered not because of the lack of conclusive information but because of political assumptions about who takes the risk. The notion of 'scientific neutrality' accepts these assumptions, implicitly siding with corporate/industrial interests to postpone the protection of worker

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*Vaccination directly from smallpox patients has been known since 1720. Jenner developed the practice of vaccinating from cowpox in 1798.

health" (Coye 1979:173, emphasis in the original). The same point could be made about the population in general. While scientists debate, we ask that all people take the risk of living in an environment that may make them ill instead of asking that the owners of businesses and industries take the risk of losing money.

To effectively prevent disease it is necessary to reverse in our minds the chain of causality implied by the germ theory. The usual conception, ideally suited to the treatment of diseases, falls short when applied to their prevention. Virtually all the factors in disease causality exist first in the environment (the exception may be in genetically-linked disorders like Huntington's chorea and hemophilia), and it is to the environment we need to look first if we hope to find health. Any approach to disease causality less extensive than an environmental hypothesis favors the health of some people over others and makes health dependent on class. The germ theory and the lifestyle theory have important places in public health programs but for effective public health policy they must remain secondary to environmental considerations.

The reason for insisting on this conceptualization is not merely theoretical. When we place the environmental cause of disease at the far end of the chain we condone the very limited disease prevention practices advocated by industrialists. We buy into the idea that protecting industry take precedence over protecting health. We opt for the disease prevention program which least interferes with industrial production.

To the extent that we choose such action we are following a well-worn path. Disease prevention policies which serve the interests of industrial production emerged with the birth of industrial society. The following chapter shows how such economic and political considerations affected beliefs about disease causality in the nineteenth century.

CHAPTER II

THE NINETEENTH CENTURY DEBATE OVER DISEASE CAUSALITY

In which we learn that an environmental theory once served the interests of a powerful group of people

The current controversy over the causes of chronic disease calls to mind a similar nineteenth century debate. At that time, too, people disputed the etiology and the means of prevention for a group of major diseases. The ideas they held about the origins of disease resemble ours in all but one respect. Instead of a fascination with diet as a cause of disease they worried that disease might be brought about by supernatural forces. Along with this they entertained a contagion theory, a lifestyle theory and an environmental theory. The dispute over which theory best accounted for disease was officially settled--for nearly fifty years--with the passage of the Public Health Act of 1848 in Britain, an Act which legitimized one notion about the cause of disease and relegated the other contenders to folklore.

The notion which became preeminent was an aspect of the environmental theory: the hypothesis--suddenly raised to the status of fact--that disease results from inhaling the odor of decomposing organic material. This curious miasma principle, which fostered the path-breaking sanitary movement of the nineteenth century's second half, constitutes the subject of this chapter. Why did people come to believe so wholeheartedly in the danger of miasmas? What prompted them to accept an environmental theory of disease causality and to institute sanitary reform at the height of classical liberalism?

I

Although population graphs indicate an overall steep and steady fall in the British death rate beginning about 1770 (McKeown 1976), people in the nineteenth century still faced sudden uncontrollable epidemics which sent the death rate up again for short periods, mainly in the growing urban slums where life was for many a continual battle against disease. The most prevalent disease was tuberculosis, an ailment responsible for as much as a third of all deaths (Flinn 1965:11). Other upper respiratory tract infections took almost as great a toll on the lives of poor people, followed by a variety of intestinal infections. This is expressed in tabular form below.

Death rate per million 1848-54--England and Wales

tuberculosis (respiratory)[a]	2,901
bronchitis, pneumonia, influenza	2,239
cholera, diarrhea, dysentery	1,819
old age	1,447
convulsions, teething	1,312
prematurity, immaturity, other diseases of infancy	1,221
scarlet fever, diptheria	1,016
typhoid, typhus	990

Adapted from McKeown 1976, pp. 55, 58, 60, 62.

[a]Illnesses which today could be separated into specific diseases are grouped together because the diagnostic techniques in the mid-nineteenth century (being based on symptoms alone) produce different categories.

Oddly enough, men and women in all classes responded to tuberculosis with a certain amount of complacency. The disease was so widespread, its symptoms so common, its course so slow and its death so unremarkable that it was more or less accepted as an immutable fact of life (Flinn 1965:11).

Indeed, its victims were often romanticized, as any devotee of nineteenth century European literature knows. As for the other non-epidemic diseases, most of them too might have been accepted with forebearance were it not that the lives they took were principally children's. Nevertheless, the anguish these diseases caused was regarded as a personal burden. The diseases which gave rise to mass terror and which inspired demands for political action were the infamous epidemic diseases: cholera, typhus, and, because of the fear that it might return, plague.

In the nineteenth century everyone knew that all three of these diseases have an abrupt onset, cause great physical pain and suffering and are fatal to the majority of their victims. In addition, it was common knowledge that death was often extremely rapid and that successful medical treatment was only a matter of chance.

Typhus had had a long history in Europe. First breaking out during a civil war in Spain in 1489, it accompanied virtually every European war and revolution for the next four hundred years. For its Spanish debut it was said to have killed 17,000 of the soldiers supporting Ferdinand and Isabella, whereas the military enemy took only 3,000 (Zissner 1935:243). Similar devastation was reported during a series of sixteenth century wars and during the Thirty Years War in the seventeenth century, the Seven Years War in the eighteenth and the Napoleonic Wars in the nineteenth.

In England typhus had been endemic since at least the sixteenth century and was known there as "gaol fever" for it was a constant feature of jails and prisons, even breaking out on occasion to infect judges and juries (Hobson 1963:30). But as the Industrial Revolution

swung into full operation, typhus took up residence in the tenements surrounding the new factories and began to claim the lives of urban dwellers in unparalleled numbers. At one point (in 1848) it was the cause of fourteen out of every 1,000 deaths in England and Wales (Flinn 1965:10). It was a major contender for the honor of halting the long downward trend in the overall death rate, a trend which not only leveled out at the beginning of the nineteenth century, but for a short period reversed itself (Flinn 1965:13). Between 1831 and 1841 the death rate per thousands in the manufacturing towns of Birmingham, Leeds, Bristol, Manchester, and Liverpool increased from 20.65 to 30.8 (Finer 1952:213). In many industrial areas during those years the life expectancy at birth for the upper classes was twice that of the working class (Ringen 1979:114).

The other frightening disease was cholera. In contrast to thyphus, cholera was a new disease in Europe in the nineteenth century. Unknown outside India before 1817, it suddenly broke whatever bonds had held it there and, on five separate occasions, swept across the face of the globe. Epidemics lasted from six to twenty-two years. After the first in 1817, there was a second beginning in 1826, a third in 1840, a fourth and a fifth in 1863 and 1883, respectively. Its advance was relentless, like an army's, and in its wake lay devastation. Moscow and her administrative districts had 8,431 cases and 4,588 deaths between September 1830 and January 1831 (McGrew 1965:91). The Scottish epidemic of 1832 killed nearly 10,000 (Creighton 1965:815). During the 1832 carnival week in Paris, 5,523 people died from the disease (Creighton 1965:821). And in France it took 150,000 lives in 1849 (Ackerknecht

1965:26). Reports of similar tragedies reached Europe from the Americas where cholera first appeared in 1832 and from Asia, the Near East and Africa.

The cholera epidemics intensified the demand for effective government action that typhus prompted, partly because unlike the more familiar disease, cholera attacked the upper classes almost as frequently as the lower. In addition, the death rate was somewhat higher. (Harrison [1958:894, 1035] reports a death rate of 50 to 70 percent for cholera and up to 60 percent for typhus.) The traditional prevention measures were even less effective and the disease brought on a quicker and more horrible death than any disease since plague.

The dread of plague still hung over Europe in the early 1800s, even though the disease had been absent for a hundred years, for no one knew if it might return. When the drowned body of the poet Shelley washed up on the shore of Tuscany in 1822, Italian authorities would not at first allow Shelley's friends access to it, so fearful were they that he might have died of plague (Marks and Beatty 1976:250). Creighton (1965: 140) mentions a 1799 rumor of plague in London and the continued presence of the dread disease in the Middle East prompted a British navy surgeon to write in 1801, "To the list of the three contending powers in Egypt, Britain and Turkey must be added a fourth, bubonic plague, perhaps the most masterful belligerent of all" (quoted in Marks and Beatty 1976:253).

The first epidemic of bubonic plague, the Black Death, raged across Europe between 1346 and 1350, and in these four years took with it the lives of one-third of the population. In some towns, half or more of the people died in a single year (see Marks and Beatty 1976). The terror

and the economic upheaval probably have never been surpassed. Four more plague epidemics followed the Black Death in the fourteenth century, seven in the fifteenth, seven again in the sixteenth, and six in the seventeenth (Ackerknecht 1965:16). In the eighteenth century, plague mysteriously died out in Europe, the 1720 attack in Marseille marking the end of its European history. The records of these epidemics all tell similar stories: of entire families dying within a few hours, of empty homes and deserted streets, of boarded-up shops, of cattle roaming untended in the countryside, of uncultivated fields and boat-less water ways. Sometimes on first noticing the signs of the disease, people would crawl off to die alone, and abandoned corpses would be discovered in ditches and fields and in vacant houses. Finally, no one could be found to bury the dead, nor was there room to dig more graves. The silence in the streets was broken only by wailing and the tolling of bells (see Defoe 1928, for example).

The fear that these three diseases inspired in Europe in the nineteenth century must have been heightened by everyone's knowledge that virulent epidemics of yellow fever periodically swept the Americas and Africa. Yellow fever did not appear in Europe above the most southern regions of Spain and Portugal--nor has it ever infected Asia--but there was no rationale for this* and, like plague, no one could say for sure that it would not come to Europe next.

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*To this day the continued absence of yellow fever from Asia is a medical mystery. Its vector is there in abundance (R. M. Taylor 1951: 532).

II

Today we know that lice and fleas carry epidemic typhus, that contaminated water or food transmit cholera, that bubonic plague is conveyed by fleas, and that the Aedes aegypti mosquito is the vector of yellow fever. Such knowledge does not automatically transfer into successful disease prevention programs--all four of the above diseases are still endemic and sometimes epidemic in vast areas of the world (Reeves 1971; Ackerknecht 1965)--but at least the biological causes of these diseases are now universally acknowledged. In the nineteenth century there were only conflicting opinions, and disease prevention measures, both personal and public, took a variety of forms, each based on one or another of the current hypotheses of disease causality. For the most part the measures were centuries-old and they applied indiscriminately to all diseases.

Most government, or official prevention was based on the contagion hypothesis, as it had been since the Black Death. The Venetians instituted quarantine of ships in 1348 (Rosen 1958:58) and the practice of isolating vessels suspected of carrying infection continued throughout the subsequent plague epidemics. In some cases ports were completely shut down; those on the Black Sea closed for two years during one plague epidemic (McGrew 1965:98). But the traditional period was forty days ("la quarantina") during which ships, their crews and cargoes waited off shore or at some isolated island.

When cholera began its deadly journey around the world in the early nineteenth century, the first reaction of most authorities was to reinstitute quarantine, but this time the suggestion met with an enormous

controversy, and quarantine was both irregular and inconsistent from place to place. At port cities the question of whether to keep quarantine was a matter of dispute during most of the nineteenth century.

On the land, isolating the sick from the well took other forms. In some cities the officials hoped to halt the spread of disease by quarantining houses in which anyone fell ill, prohibiting the entire household from leaving until the sick were either once more well or dead. In other places the sick were rounded up and forced into isolated hospitals. Like ship quarantine both practices dated back to the Black Death and gave rise, in all periods, to much grief, inconvenience and ill-will. The official plague rules in England in 1593 give some idea of the severity of home quarantine at that time.

> . . . in every howse infected, the Master Mistris or governour, and the whole famulie and residentes therein at the tyme of such Infeccon, shall remayne continuallie withowt departinge owt of the same, and with the doores and windowes, of the hall, shopp, or other nether parte of the howse shutt, by the space of xxviii dayes from the death of the partie dying of Infeccon, and vntill the partie sicke and not dying therof shalbe fullie recovered, or there sore fully healed, and suche person recoveringe or healed to tarry shutt vpp xx daies from suche recovery or full healing. (Shakespeare Association 1933:ix)

It is little wonder that some people broke out of their quarantined houses and fled town (Nicholson 1919:20).

During the cholera epidemics in Russia, the police were charged with identifying and bringing in suspected patients. They seized anyone who looked suspicious. So brutal were they that "[n]o person was safe on the streets. The sick and cured well, the inibriates and the infirm were collared, dumped unceremoniously into the dreaded cholera carts, and hauled off willy-nilly to the lazarettes, often with whole families trailing the wagons weeping and wailing" (McGrew 1965:109-110).

In addition to isolating the sick individually, it was common throughout the centuries to set up a "cordon militaire" around infected towns. Sometimes people could come and go as long as they showed no signs of disease and sometimes entire cities and their environs were closed, either to keep disease in, or to keep it out. When yellow fever struck Philadelphia in 1793, Baltimorians refused to let anyone into the city who had been in Philadelphia during the previous seven days and other East Coast cities soon followed suit (Powell 1970:238). Later, in Russia, the authorities tried to protect Moscow by cutting off all roads to the city (McGrew 1965:78) and they extended the practice to other major citites around the country as the disease spread.

Isolation and quarantine also applied to physical objects like the suitcases and trunks of travelers, which were not only fumigated but in some instances kept at check points for a week or more although their owners were free to continue their journeys (McGrew 1965:46; Duffy 1966: 45). Accounts of nineteenth century epidemics tell how unaccompanied goods being transported from an epidemic area had to be unpacked and aired or fumigated. In Venice in 1493 the government actually took to washing money with vinegar and fumigating incoming letters and packages (Winslow 1967:119). Washing money doesn't seem to have caught on elsewhere, but slitting open and fumigating mail became common and continued in some places well into the twentieth century (Marks and Beatty 1976: 210).

What went on in people's homes was harder to control but official nineteenth century rules in many cities mandated fumigating or washing the bedding and clothing of the sick. Like the idea that people carried

disease, the idea that linens could become contaminated dated back hundreds of years. The Elizabethan tract quoted above states "noe Clothes, Linnen, or other like thing be hanged owt or over into the streete." During the first cholera epidemic in Russia, people were ordered to wash their sick relatives' bed linens and clothing in brine and lye (McGrew 1965:46). At about the same time the Central Board of Health in England ruled that "goods" in the homes of the sick should be purified and burned (Hobson 1963:81).

People in the nineteenth century had good reason to follow such regulations for most believed that contaminated clothing--especially, it seems, if it had been stored for a long period in a closed container--was dangerous. A chest of infected clothing brought to Philadelphia from the West Indies was widely believed to have started an early epidemic of yellow fever (Powell 1970:14) and many stories like the following circulated during cholera epidemics.

> A Cromarty fisherman had died of cholera at Wick [in 1832]; his clothes had been ordered to be burned, but a brother of the dead man, who was in Wick at the time, secured some of them and brought them home. He kept them in his chest for a month before he ventured to open it. Next day he was seized with cholera and died in two days. Thereafter the disease crept about the streets and lanes for weeks, striking down both the hale and the worn-out. (Creighton 1965:815)

Personal practice, primarily the avoidance of other people, augmented official prevention measures based on contagion. Chroniclers of epidemics often remark on the accompanying breakdown in human intercourse. In his account of the Philadelphia yellow fever epidemic in 1793, which took the lives of nearly one-eighth of the population (Winslow 1952: 53), Powell says:

> People quickly acquired the habits of living with fear. Handshaking was abandoned, acquaintances snubbed, everyone

> walked in the middle of the streets to avoid contaminated houses. Those wearing mourning bands were obviously dangerous, as were doctors and ministers. People maneuvered in passing to get to windward of anyone they met. (pp. 48-49)

While some people simply shut themselves up in their homes, for others the fear of contagion reached such heights that they abandoned even their own families when the signs of illness appeared. An account of the Black Death laments that

> brother forsook brother, uncle nephew and sister brother and ofttimes wife husband; nay (what is yet more extraordinary and well nigh incredible) fathers and mothers refused to visit or tend their very children, as they had not been theirs. (Quoted in Marks and Beatty 1976:80)

The contagion hypothesis was embellished by whatever xenophobic and prejudicial attitudes prevailed at the time. During the Black Death untold thousands of Jews were executed for their presumed role in causing the disease--perhaps as many as 12,000 in Strassbourg alone in 1349 (Ziegler 1969:103). During subsequent plague epidemics lepers, grave diggers and supposed witches as well as Jews suffered derision, torture, expulsion and often death for the same reason (Ackerknecht 1965:14; Ziegler 1969:971).

In Brazil, a seventeenth century yellow fever epidemic served as an excuse to constrain women; all prostitutes were sent away or jailed and no women could leave their homes unless accompanied by their slaves, husbands or parents (Franco 1971:92).

When cholera first came to Russia, a rumor circulated among the poor that the wealthy class had invented the disease as a new means of oppressing them, and some people, suspecting foreign doctors of a role in disease transmission, set upon physicians in the street and beat them (McGrew 1965:7, 110). In England, suspicion centered on the Irish

("The Irish in Birmingham are the very pests of society; they generate contagion" [Flinn 1965:15]). The Indians of course blamed the English while in Italy both the British and the French were reputed to be responsible for epidemics (Veith 1954).

Sporadic scientific writings had bolstered the contagion theory for centuries by proposing methods by which disease could be transmitted among people. A number of sixteenth century thinkers--the most notable being Giolamo Fracastoro in 1546--had suggested the existence of "congaguim animulum." In the seventeenth century, the name Leeuwenhoek stands out from another group because of his discovery of "little animals" in his microscope. The eighteenth century produced a few more elaborations on what would eventually be known as the germ theory of disease but the whole idea had already begun to lose adherents. By the time Jacob Henle wrote his now-famous description of the connection between illness and microorganisms in 1840 the contagion hypothesis was in such disrepute that scarcely anyone paid attention. To his contemporaries Henle was old-fashioned and obsolete (Ackerknecht 1948:568).

The trouble with the contagion hypothesis was that it didn't account for enough. There were simply too many instances where people became ill regardless of their isolation from human contact, and too many others where brave souls nursed the dying, cradled them in their arms and carried their bodies to the graveyards, yet did not get sick at all. As Winslow points out, "Until the theory of inanimate contagion was replaced by a theory of living germs and until to that theory were added the concept of long-distance transmission by water and food supplies and, above all, of human and animal carriers--the hypothesis of contagion simply would not work" (Winslow 1967:182).

Because of its failures to be predictive, an exclusive reliance on the contagion theory did not seem, to most people, to be wise, so they augmented it with preventive measures based on at least three other hypotheses.

* * * * *

Many clung to the ancient idea that disease has supernatural origins. The early Protestants, following the New Testament, attributed disease to demonic influences and thus saw it as a manifestation of the ongoing struggle between God and the Devil and an event, therefore, over which people have virtually no control (Winslow 1967, chapter 1). But by the nineteenth century, even Protestants were more likely to accept the Old Testament teaching, previously subscribed to mainly by Catholics, that disease is God's way of punishing men and women for their sins. Thus one way to prevent (and cure) disease was through propitiation. The following prayer, written when yellow fever hit New Orleans in 1853, and read at a special service for all Protestant Episcopal churches there, contains all the measures dictated by the supernatural theory: praise the lord, confess your unworthiness, repent of your sins and humbly ask to be spared from disease.

> Oh! Almighty and merciful God, to whom alone belong the issues of life and death, we, thy servants, bowed down under a deep sense of our unworthiness, do meekly acknowledge that we have grieviously sinned, by thought, word and deed against thy Divine Majesty; and that by our sins we have most justly provoked thy wrath and indignation against us. But oh! God, who desireth not the death of a sinner but rather that he should turn from his wickedness and live, be merciful unto us, be merciful unto they people who turn to Thee with unfeigned confession and humiliation, and give us grace, that we may truly repent us of our sins past, and be turned unto Thee, the Lord our God, with full purpose of amendment of life. Spare us, good Lord, spare they servants, who are grieved with the

> remembrance of our sins, and turn from us the ravages of the pestilence, wherewith, for our iniquities Thou art now visiting us. And mercifully grant that while this, thy Fatherly correction, may teach us, ever, hereafter, to be mindful of Thy righteous judgment, it may also impress us, with a sense of our dependence upon Thee; lead us, now, to put our whole trust and confidence in Thy mercy, and evermore to serve and please Thee, in newness of life, through Jesus Christ our Lord. Amen. (Duffy 1966:91)

The supernatural theory of disease causality implies a powerful role for the church during epidemics and a potential conflict between the clergy and representatives of any other institution also claiming preventive expertise. However, the dominant ideology in the nineteenth century was fundamentally secular and supernatural beliefs never gained a significant foothold. In any event, the supernatural theory of disease proved consistent enough with other approaches to continue unchallenged among the less determindedly "enlightened" sector of the population. It fit most obviously with a third major approach to disease: the theory that disease is a result of improper living.

* * * * *

Only the very isolated could have been unaware that disease struck some groups of people harder than others. Proponents of this lifestyle theory tended to characterize those who suffered most from diseases as intemperate, drunken, immoral and unclean and then to call disease a result of those presumed qualities. The connection between this notion and the supernatural hypothesis is expressed in a 1667 tirade, written during that year's infamous plague epidemic in England and entitled "God's Terrible Voice in the City":

> . . . and now they have received the sentence of death within themselves, and have certainly concluded, that within a few hours they must . . . appear before the Highest Majesty, to render their accounts, and receive their sentence. None can utter the horror which hath been upon the spirits of such,

> through the lashes and stings of their guilty consciences, when they have called to mind a life of sensuality, and profaneness, their uncleanness, drunkenness, injustice, oaths, curses, derision of Saints and holiness, neglect of their own salvation . . . (Nicholson 1919:120)

To proponents of this view, prevention lay not in changing whatever factors caused despair or filth, but in living differently in spite of them. Preserving health was entirely a personal responsibility, and if there was more disease among the poor it was because, as a Boston physician put it in 1821, the "lower orders" are wont to "a total neglect of cleaniness" and an "unnatural apathy" for looking after the sick (quoted in Black 1959:240). While noting that poor people live in "insalubrious surroundings, such as filthy streets, deficient sewerage, neglected privies and ill-ventilated dwellings" and that these conditions are a cause of disease, the 1865 Report on public health by a citizens' commission in New York City also blamed the "ignorant and careless habits of the people themselves" (Citizens' Association of New York 1970:xvi).

In other words, the early life style approach to disease closely resembles the current one. Disease can be prevented by eating good food, sleeping regularly in wholesome surroundings, keeping house and body clean and avoiding stressful situations--exactly the stereotyped (if not the typical) life style of the well-to-do, and precisely the way of life most difficult to follow for the new labor force, working for a pittance fifteen hours a day in factories and returning home to impossibly crowded slums without water, sewerage, heat or ventilation.

"The true means to preserve the natural tone of the body," airily wrote Noah Webster in 1799 in his enormously influential History

of Epidemic and Pestilential Diseases, "are the most natural means" (Webster 1970, Volume II, p. 232). He then goes on to suggest that one should eat just the right amount of food. "Too much produces unusual excitement, which is followed by indirect debility, a state of body which invites an attack of pestilence. Too little nourishment, on the other hand, induces direct debility, a state equally favorable to disease" (Vol. II, p. 233). He warns against excessive sunshine ("Nothing is more dangerous than the burning heat of the sun . . ." p. 234) and physical exertion. "Labor should not be violent, and walking moderate" (Vol. II, p. 235). To maintain health one needs an easy supply of water, for " . . . Fresh water, frequently applied to the body receives and carries off all matter of infection, thus removing one copious source of the disease" (Vol. II, p. 238). But he warns against actually plunging into cold streams or rivers. "Few persons can sustain the shock, unless in good health . . ." Instead one should dab warm water on the body in the privacy of one's home "With the hand, or a sponge, in a few minutes, as the person rises in the morning or retires at night" (Vol. II, p. 239).

Bathing, however, remained such an uncommon activity* that a hundred years later Gunn's New Family Physician, a three-and-a-half inch thick volume calling itself a "complete household guide"--then in its two-hundredth edition--devoted two chapters to detailed instructions about how to do it. The author believed that "any fever may be cured by cold water" (Gunn 1883:173) and recommends that men take warm baths at least once a week, "certainly a fortnight should not pass without one" (p. 175).

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*Even the White House didn't have a bathtub until 1858 (Ackerknecht 1955:200).

Dr. Gunn is particularly interested in the relation between mind and body. Pride, envy, fear, anger and despair "sap the foundations of health and shorten the period of existence" (p. 41) while hope, cheerfulness, joy, forgiveness and charity "cause a universal expansion of vital action . . . [they] promote perspiration, quicken the pulse, promote the circulation, increase the appetite, and facilitate the cure of disease" (p. 79).

Lest such a viewpoint be regarded as peculiar to Victorian morality, one should note that a seventeenth century Brazilian report on yellow fever advises people to avoid the disease by maintaining agreeable conversation (it relaxes the mind), playing soft music (it remedies insomnia) and shunning the passions of the soul: "strong feeling, melancholy, hate, sadness, anger, fear of death and of the dead from the pest" (Franco 1971:97).

Noah Webster's connection between "natural" methods of disease prevention and a way of life available only to the middle and upper classes took another form in the nineteenth century with the popularity of "water cures" and the "discovery" of exercise. The well-to-do, whether treating or hoping to prevent disease traveled from spa to spa "taking the waters." They bathed, following a prescribed regimen, were wrapped in wet sheets and blankets and they took long walks. Anticipating the current interest in exercise, the last century saw dozens of books, pamphlets and public lectures extolling the healthful virtues of running, walking, swimming, horseback riding, field sports and games and ball playing. Even women were encouraged to become athletic, and for the first time physical education was introduced into schools (Betts 1971).

"Exercise," wrote Dr. Gunn, "is very important in the cure of disease, and if more of it were taken and less medicine used, it would be better for mankind" (1883:182). But like Noah Webster, he entirely missed the point in connecting social class and disease.

> Taylors, sawyers, shoemakers, engravers, watchmakers and many others such as cotton-spinners, dress-makers, present either awkward movements in limbs or eyes, or are sickly or sallow-looking. Such parties are commonly affected with indigestion, giddiness, headache or diarrhea . . . [T]here is no remedy for the evils referred to, but taking as much bodily exercise and out-door recreation as possible. (p. 183)

A major component of the lifestyle hypothesis, overlapping with contagionist ideas, was the belief that cleanliness can prevent disease. Except for bathing as a semi-recreational, semi-medicinal activity in spas and the cautious encounters with water recommended by people like Gunn and Webster, the hygiene prescribed was not of the skin or hair but of the home. At one time the Moscow Cholera Council even had authority to go into people's homes "to ensure that cleanliness, the first necessity for protection against disease, was strictly observed" (McGrew 1965:80). Earlier, Russia's Central Medical Council had listed the maintenance of clean houses as well as clean bodies as a preventive measure and urged householders to wash their walls as well as fumigate (McGrew 1965:65). It is typical of this point of view that when Philadelphians realized that yellow fever was spreading through the city in 1793 one of the first things they did was scour and whitewash their walls (Powell 1970:48). Unlike other nineteenth century preventive measures, however, domestic hygiene was not particularly old. It was recommended in the seventeenth century in Brazil (whitewash for

walls, quicklime for floors (Franco 1971:92)), but earlier records only mention shutting up of houses, not cleaning them.

* * * * *

When cleanliness was defined as absence of odor, hygiene became part of yet a fourth theory about disease: the doctrine, specifically antagonistic to contagionism, that disease is the result of atmospheric phenomena. This environmental theory of disease causality dates back to the Greek conception of four elementary properties in the world: wet, dry, hot, and cold. The ancient Greeks related these properties to four basic substances: earth, fire, water and air; these in turn corresponded to the four "humors" of the body: yellow bile, black bile, phlegm and blood. Maintaining health was a matter of keeping the four humors in balance; sickness resulted when any one humor became preponderant. These building blocks drew the attention of anyone interested in disease causality to the changing seasons and to unusual atmospheric conditions. Hippocrates, relying on the Greek concept of "epidemic constitutions," made particularly acute observations about the relation between climate and disease, noting, for example, the connection between malaria and swamps and the association of intestinal disease with certain kinds of water (Winslow 1967:65). Each season brought its diseases: spotted fever, asthma, consumption and pneumonia in the winter; cholera, dysentery and diarrhea in the summer; and pleurisy, croup and inflammation of the brain in spring and fall (Jones 1967).

From this beginning the relation between disease and weather was a matter of common sense as well as a subject for learned scholarship for

nineteen centuries. Observations about the weather--of drought, or an especially long winter or a cold spring, or an unusually warm autumn--commonly accompanied descriptions of epidemics from Greek times onward.

The connection between the atmosphere and disease was subject to a number of interpretations. Originally, many believed that the air becomes pestilential or "corrupted" by earthquakes, tidal waves, blazing comets, thunder and lightning, great storms or volcanic eruptions. But this simple cause and effect model was challenged by Noah Webster at the end of the eighteenth century. He argued that these violent occurrences were not themselves the cause of disease but instead the result of subtle atmospheric changes which also caused pestilential air (Webster 1970, Vol. I).

A century earlier Thomas Sydenham, the "English Hippocrates," had wrestled with the Hippocratic notion of epidemic constitutions and decided that there are "different constitutions in different years. They originate neither in their heat nor cold nor wet nor drought, but they depend upon certain hidden and inexplicable changes in the bowels of the earth. By the effluvia from these the atmosphere becomes contaminated and the bodies of men are predisposed . . . to this or that complaint." Sydenham explains that these changes in the bowels of the earth cause the air to be "stuffed full of particles which are hostile to the economy of the human body . . ." (quoted in Keele 1974:242).

Whether pestilential air was caused by typhoons or seasonal changes or elusive atmospheric modifications or alternations in the bowels of the earth, people were helpless to control the basic cause of disease. It was much like believing in demonology. One's main recourse was to fumigate the air after it had become infected.

Three basic methods evolved. The first was to light great bonfires in the city streets. Hippocrates is said to have ordered the burning of fragrant leaves, flowers and ointment during epidemics (Winslow 1967:66) and the practice continued into the nineteenth century. Reports of epidemics often contain accounts of odorous bonfires burning in town squares or at the intersections of streets. Eventually someone thought of burning not-such-aromatic substances presumably because fierce disease would respond better. During the 1853 yellow fever epidemic in New Orleans, frantic officials burned barrels of tar throughout the city and at the cemeteries, filling the air with such thick clouds of heavy, black smoke that the city resembled a Northern manufacturing center (Duffy 1966:87-88).

A second method was to set off explosions--shooting artillery or firing cannons at regular intervals throughout the day. It was believed to work "because the violence of the [artillery] fire is like a famished beast that by running wild disperses everything" (Franco 1971:92). At least one man even attributed the 1793 Philadelphia yellow fever epidemic to an absence of thunder, a result, he thought of all the newfangled lightning rods around town (Powell 1970:52).

Third, people took personal precautions to keep the air immediately around them pure, using fragrant oils (eau de Cologne was believed to ward off the plague) and less pleasant articles--onions, for example, or dead toads. There was a thin line between fumigating the air and wearing amulets. Powell says that in Philadelphia those who dared to walk abroad during the 1793 yellow fever epidemic carried

> tarred ropes or camphor bags and chewed garlic constantly, doused themselves with vinegar, carried smelling bottles

> or smoked tobacco. They emitted a curious odor for several yards. Even women and small boys . . . had segars almost constantly in their mouths . . . (Powell 1970:48).

The January 1900 issue of the Quarterly Journal of the Royal Meteorological Society suggested another way to fend off atmospheric disease. The author explained that bubonic plague is due to specific organisms of "infinitesimal size" which are carried by air or vapor and he reasoned that since soil temperature and humidity correlate with epidemics of plague, it would be possible to prevent the disease by throwing a lot of water around, both to saturate the ground and to make the air humid. To the extent that this was taken seriously, some home hygiene efforts apparently based on contagion or lifestyle ideas, were actually grounded in atmospheric principles (Lorch 1965).

The atmospheric theory of disease contained within it another concept, however, one with obvious political connotations. This idea traced the pestilential air not to uncontrollable meterological or seasonal conditions but to the foul odors which emanate from putrifying dead bodies (both animal and human), decomposing garbage and fetid human wastes. Proponents of this "filth" theory, believing in the danger of smell itself, recommended cleaning streets of garbage, burying the dead very deeply (during some epidemics the city burial places, crowded to their limits with hastily dug shallow graves, gave off nauseating odors), ventilating crowded rooms and controlling the miasmas arising from cesspools, privies and sewers. They called for massive and centralized government regulation of urban sanitation.

No one could deny that disgusting smells accompanied the Industrial Revolution, especially in Briton. To house the flow of people pouring into the cities, unscrupulous builders erected slapdash dwellings around

factories in which people were packed together in appalling conditions. There was no sewage system and, in some areas, as many as 100 people shared a single privy (Finer 1952:215). Not infrequently, houses were built back to back preventing the passage of air through the rooms, with the unpaved streets in front providing the only place to discard cooking slops and human wastes. Backyards and side lanes, where they existed, quickly became cesspools.

Proponents of the "filth," or miasma theory argued their case with descriptions of nearly unbelievable living conditions among the disease-ridden poor. Edwin Chadwick's 1842 Report of the Sanitary Condition of the Labouring Population of Great Britain, implying throughout that foul ordors cause diseases, serves as an excellent example of such arguments:

> Shepherd's Buildings consist of two rows of houses . . . placed back to back. There are no yards or out-conveniences; the privies are in the centre of each row, about a yard wide; over them there is part of a sleeping-room; there is no ventilation in the bedrooms; each house contains two rooms, viz., a house place and sleeping room above; each room is about three yards wide and four long. . . . The street between the two rows is seven yards wide, in the centre of which is the common gutter, or more properly sink, into which all sorts of refuse is thrown; it is a foot in depth.
>
> Thus there is always a quantity of putrefying matter contaminating the air. At the end of the rows is a pool of water very shallow and stagnant, and a few yards further, a part of the town's gas works. In many of these dwellings there are four persons in one bed. (pp. 91-92.
>
> From the absence of drains and sewers, there are of course few cellars entirely free from damp; many of those in low situations are literally inundated after a fall of rain. To remedy the evil, the inhabitants frequently make little holes or wells at the foot of the cellar steps or in the floor itself; and notwithstanding these contrivances, it has been necessary in some cases to take the door off its hinges and lay it on the floor supported by bricks, in order to protect the inhabitants from the wet. Nor is this the full extent of

> the evil; the fluid matter of the court privies sometimes oozes through into the adjoining cellars, rendering them uninhabitable by any one whose olfactories retain the slightest sensibility. In one cellar in Lace-street I was told that the filthy water thus collected measured not less than two feet in depth; and in another cellar a well, four feet deep, into which this stinking fluid was allowed to drain, was discovered below the bed where the family slept! (p. 105)
>
> . . . The filth of the gaol, containing on an average 65 prisoners, is floated down the public streets every second or third day, and emits, during the whole of its progress down Broad-street, Bow, Baker-street, and King-street, the principal streets in the town, the most offensive and disgusting odour. 2nd. The slaughter-house is situated near the top of the town, and the blood from it is allowed to flow down the public streets. 3rd. The lower part of a dwelling-house, not more than three or four yards from the town-house and gaol, is used as a "midding," and pigsty, the filth being thrown into it by window and door. 4th. There are no public necessaries; and the common stairs and closes, and even the public streets, are used habitually as such, by certain classes of the community. 5th. Two drains from the castle, convey the whole filth of it into an open field, where it spreads itself over the surface, and pollutes the atmosphere to a very great extent . . . (p. 108)

The Sanitary Report recommended massive reforms. Chadwick wanted "drainage, the removal of all refuse of habitations, streets and roads, and the improvement of the supplies of water" (p. 243). His specific interest was in a sewage system capable of carrying household wastes away from the city. At the time he wrote, cities had drains for run-off from the street but they were not connected to houses (indeed hook-ups were forbidden) (Finer 1952:214) and their brick construction, right angles, and irregular slope frequently turned them into cesspools instead of drains. Additionally, the water companies only supplied water at centrally located pumps on certain days at certain hours (Finer 1952:222). In order to prevent disease, Chadwick proposed piping water to every home, connecting each house to the sewers and redesigning sewers, shaping them like the cross section of an egg to force water at

high pressure continually through the system (Finer 1952:221 and Chadwick 1956:127-130). His plan called for a single administration to take over from the decentralized, fragmented authority then responsible for house drainage, street sewerage, water supply, land drainage and road structure (Chadwick 1956:394-396, 423-425).

The publication of the Sanitary Report was a major event in a ten-year struggle to win support in Parliament for an environmental approach to disease control. Lesser reports had preceded it and an extensive lobbying campaign of public forums and pamphleteering followed it. Despite the fact that it raised the ire of large numbers of influential people including the physicians championing contagion theory, the owners of water companies, the exponents of local government and the editors of the Times (Rosen 1958:224), it culminated in the Public Health Act of 1848, giving official sanction to the miasma theory of disease and laying the foundations for what some (see, for example Navarro 1974), a bit grandly, have called the sanitary revolution of the nineteenth century.

A fundamental difference distinguishes the nineteenth century sanitary movement from contemporary public health laws. Today's regulations supplement contagion theory. We think of rotting garbage and open cesspools, stagnant water and unventilated buildings as indirect causes of disease. To the nineteenth century mind these were primary. Filth, people believed, directly causes disease. The air rising from or blowing across decaying organic matter was thought to be injurious to the body and dangerous to inhale, a conception similar to the present-day understanding that radioactive air or air laden with asbestos particles is harmful. In 1846 Southwood, Smith explained the mechanism thus:

> Whenever animal and vegetable substances are undergoing the process of decomposition, poisonous matters are evolved which, mixing with the air, corrupt it, and render it injurious to health and fatal to life. . . . If provision is not made for the immediate removal of these poisons, they are carried by the air inspired to the air-cells of the lungs, the thin delicate membranes of which they pierce, and thus pass directly into the current of the circulation. It has been shown that by the natural and ordinary flow of this current, three distinct and fresh portions of these poisons must necessarily be transmitted to every nook and corner of the system in every eight minutes of time. (Quoted in Finer 1952:297)

The acceptance of the miasma theory, with its radical implication that disease is environmentally caused, came about after a generation's struggle between contagionists and anticontagionists, but not as a result either of a sudden public demand for a single theory of disease, nor from some set of indisputable medical facts raising miasma theory above other hypotheses. The change came because for Europeans the Industrial Revolution created a new world, a new way of thinking about the world, and a new class of people to manage the world.

III

The foregoing catalog of disease prevention measures should not leave the impression that people usually tried to connect what they did to avoid diseases to a particular causal theory and to argue its efficacy on that basis. Up until about the eighteenth century, most people didn't assume a single cause for an event; there were hundreds of reasons for occurrences, all interacting and overlapping and doubling back upon one another. In a world where change was so slow as to be imperceptible one did not think of progress or origins nor did one think in terms of a human power able to understand what was essentially the realm of God. Thus when disease struck, no belief in the ultimate ability of men to

control events prompted a systematic quest for the cause of illness, nor was it particularly efficacious to separate illnesses into specific diseases. Instead men and women indiscriminately and with fear in their hearts set bonfires, washed walls, hung bits of tar around their necks, avoided swamps, avoided one another, prayed, burned bedclothes and sought to remain calm, rested and sober.

By the end of the eighteenth century, however, the interaction between the ideas of the Enlightenment and the early events of the Industrial Revolution had produced a new age. People needed no longer to feel dominated by nature--a mysterious ruler outside their control and beyond their understanding. Instead they could master it. The Newtonian view of the universe as a precise machine, the comprehension of which would allow men to progress infinitely, seemed borne out by the rapid industrialization of society. It remained only to ease out the remnants of traditional religious authoritarian society and to release men to develop their natural self-seeking inclinations. Once men were "free" there was no limit to their possibilities. In this atmosphere of triumph over nature and faith in human intellect, theories of disease causality were subjected for the first time to scientific scrutiny.

Because neither the supernatural theory nor the lifestyle theory--nor the more cosmic aspects of the environmental theory--lent themselves to the tools of analysis then available to science, these notions were relegated to the arena of the non-scientific. Of course many people still clung to their belief in prayer as a means of prevention and few disputed the lifestyle approach as an auxiliary method of avoiding disease. But scientific analysis focused on the testable theories of contagion and miasma, the latter subsumed under the label anti-contagionism.

The major form of analysis was the study of epidemics, a science we can trace back to the 1793 outbreak of yellow fever in Philadelphia. Subsequent yellow fever epidemics and all the disastrous cholera epidemics received careful investigation. There not being a division between "pure" and "applied" science until nearly the end of the nineteenth century, investigators were usually practicing physicians. Sometimes they studied the epidemics whose victims they treated and sometimes they travelled--often as part of official commissions--to foreign areas solely as scientists. The results of these studies proved inconclusive. Some doctors after careful consideration of the facts, pronounced epidemic diseases contagious. Others, presumably after examining another set of equally pertinent but slightly different facts, found them definitely noncontagious. A considerable controversy arose.

"There is no higher mortality rate among the members of a sick person's family," said the anticontagionists. "Hospital personnel aren't in unusual dangers. Diseases are not contagious."

"Hogwash!" replied the contagionists. "Fugitives from an epidemic take disease with them. It spreads as people move."

"But there are some places to which it never spreads," answered the anticontagionists. "Location determines disease."

"No. No. It's people," said the contagionists. "Even the bedding of the sick is infected."

"Nonsense," claimed the antis, "Dozens of dedicated physicians have tired to induce disease [see Ackerknecht 1948] experimentally by ingesting the vomit or feces of the sick and they've stayed well."

Medical societies divided along contagionism/anticontagionism lines and individual physicians were identified according to the position they took on the issue. So evenly matched were the two sides that, on a scientific level, the controversy was irresolvable. Contagionists, lacking the latter-day knowledge that disease can be transmitted by insects and in food and drink, offered only a partial explanation for epidemics. They were helpless to explain the appearance of disease in isolated people. Anticontagionists, however successful in pointing to flaws in contagionism, submitted little positive evidence for their position, and they couldn't account for a number of obvious phenomena: the lack of epidemics, particularly yellow fever, in many filthy cities, for example, or the increase of respiratory illness in winter when there is less smell.

Quite possibly the controversy, regardless how engrossing, would not have been more than an obscure medical debate were it not that traditional government policy on epidemics was based on contagionism and thus called for quarantine.

* * * * *

All during the plague epidemics of the middle ages, Europe had been agricultural. The vast majority of the land was owned by a tiny but powerful aristocracy who rented it out to everyone else to farm. Travel was infrequent, slow and uncomfortable, for roads were muddy or dusty and full of ruts and unexpected holes. Travel was unnecessary anyway because people lived in self-sufficient communities which produced all life's necessities: wool, flax and leather for clothing; wood, straw and stones for building; and all the essential products for food (Beard 1969). So insignificant was trade between

communities that even extended quarantines impacted on only a handful of people and no major economic consequence followed the concept that diseases are contagious.

By the turn of the nineteenth century all this had begun to change. In England, particularly, the Industrial Revolution was in full swing. The Enclosure Acts forced thousands of farming families into the cities where they took up new work in the burgeoning factories. Industrialists imported millions of pounds of raw cotton from India every year (the amount grew from 11 million pounds in 1785 to 588 million pounds in 1850 [Hobsbawn 1964:57] and exported an ever increasing number of yards of cotton cloth [Hobsbawn 1964:53]). Bristol and Liverpool became dependent on the infamous triangular trade in which manufacturers exported cotton and metal ware to Africa where they traded them for slaves; the slaves were shipped to the Caribbean, exchanged for sugar and the sugar imported into England (Flinn 1963:98). The total value of all exports more than doubled in the ten years between 1780 and 1800 (Flinn 1963:97). Roads, waterways, ports--and soon railroads--gained central importance to the economy. For the new class of people, building the new industrial society, quarantine spelled disaster.

Consequently, disease causality ceased to be merely a medical issue. It was impossible to separate the scientific debate about disease causality from the political consequences of its application. Contagionism meant closing ports; anticontagionism meant keeping commerce going and substituting sanitary reform for quarantine. So important was it to the new industrial class to keep the ports open that their view of the scientific question was obscured. They were blinded by their economic

interests and by the political ideology that justified these interests. So sure were they of the right-ness of industrial society that they could not imagine that it could conflict with effective disease control techniques.

Edwin Ackerknecht has brilliantly analyzed this period of medical history. He says that the physicians who advocated the contending medical theories came from distinctly different political backgrounds. "The leading anticontagionists . . . were known radicals or liberals. The leading anticontagionists . . . were [with one exception] high ranking royal military or naval officers . . . or bureaucrats . . . with the corresponding convictions" (Ackerknecht 1948:591). To refute what they saw as economically-dangerous contagionist notions, the anticontagionists dressed up the contagionist hypothesis in symbolic garb which linked it to the ancien regime. Contagionism, they implied, is the province of bureaucratic mentalities, of people with no sense of progress, left-overs from the pre-scientific era who revere authority for its own sake. In contrast, they presented the miasma, or anticontagionist hypothesis as a new idea, consistent with the ideals of progress, individualism and freedom which guided the Industrial Revolution (Ackerknecht 1948).

This liberal ideology--the notion that the purpose of society is to progress, that people are basically competitive and that if men are free from feudal obligations and bureaucratic interference, their competitive human nature can blossom and they will bring about progress--was so firmly believed by the new industrial class that it seemed an irrefutable truth, no more necessary of examination than the knowledge that the world is round. With liberalism as a basis, contagionism was unnatural.

So anticontagionists began to confuse the scientific with the economic and to use economic arguments to advocate a scientific position. They were so much a part of the new industrial class that they didn't even try to play down the economic implications of the disease causality argument. In fact, says Ackerknecht

> anticontagionists usually emphasized readily this popular aspect of the problem. They wrote long and detailed dissertations on exactly how many millions of pounds, francs, or dollars were yearly lost through the contagionist error. Chervin [a leading French physician], who characterized the whole as a political, administrative, moral, medical, and commercial problem, was not afraid of such revealing word combinations as "question du plus haut intérèt pour l'humanité et le commerce" or "entraver le commerce et consacrer une erreur funeste à l'humanité." Gaultier wrote in 1833: "Quarantine is useless and the injury it inflicts on the commercial relations and maritime intercourse of the country is an absolute and uncompensated evil." Anticontagionist medical journals reprinted speeches of commerce-minded deputies. Liberal and commercial newspapers like the Journal de Commerce, the Constitutional, and the Courier supported Chervin in 1827. (Ackerknecht 1948:590-591)

Chervin's characterization of the issue as a "political, administrative, moral, medical, and commercial problem is indeed correct. Scientific questions are, at bottom, social questions, and the fault of the anticontagionists was not that they presented scientific issues in an economic framework but that they presented economic issues in a scientific framework: they thought them value-free. It is not inappropriate to settle scientific arguments on value-filled political grounds but it can only be fair to do so when the political nature of the settlement is manifest for all to see. To pretend to be scientific and unbiased when one is arguing about social issues is unfair. More than that, of course, this tactic can lead, and has led, to monstrously inhumane public policies.

The disease causality argument gained focus in Edwin Chadwick's 1842 Sanitary Report because he recommended massive sanitary reform, not quarantine, as a method to reduce disease. A subject of Parliamentary debate for three years, the Report finally resulted in the Public Health Act of 1848, enshrining anticontagionist principles in law. The passage of the Act was not a scientific victory but a class victory. It meant that disease prevention measures need not unduly interfere with economic production.*

With the disease-causality argument so inextricably linked to the economic interests of the dominant social class and the political slogans that supported them, it is hardly surprising that it was "settled" in favor of that class. It only appears startling that the new industrialists embraced the miasma theory so wholeheartedly as to undertake the sanitary reforms of the second half of the nineteenth century. How could they eschew quarantine with the slogans of liberalism but accept the idea of a public health bureaucracy? How did they reconcile sanitary reform with the principles of laissez faire?

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*When, at the end of the century, contagionist notions in the form of the germ theory began to gain scientific favor over anti-contagionist beliefs, they did not this time threaten industrialists, for the germ theory carried with it immunological methods of disease control, thus avoiding reliance on economically disastrous quarantines.

IV

There are four answers. In the first place, the Industrial Revolution was not so much an era of laissez faire practices as it was an era of laissez faire principles. While people talked a lot about the idea of free enterprise, a considerable number of laws were passed allowing government to intervene in private transactions. Probably the best known are the Factory Acts of the 1830s which limited the number of hours women and children could work. But a series of Building Acts, the first passed in 1774 in London, gave local authorities some measure of control over the design, location, and quality of building (Flinn 1963:16) decidedly interfering with the "rights" of private property. As early as 1817 the government began to loan money to private companies for "public works" (Flinn 1965:41). In 1837 Parliament voted to provide capital to industry for shipbuilding (Checkland 1966:361). The New Poor Laws were specifically designed to make rural families move into the cities and to force them to take up employment there in factories. The Municipal Corporations Act of 1835 authorized the government to perform a wide range of social services; the Passenger Acts of 1840 regulated conditions on ships; the Bank Charter Act of 1844 subjected the banking system and note issue to contol; a series of bills about the same time regulated the amalgamation of railroads (Taylor 1972:39-42) and dictated to the railway companies the rates they could charge customers (Checkland 1966:361). And so on.

The public--and no doubt the private--discussion of these laws took place within a context of laissez faire principles. The proponents of each bill had to justify its deviance from free enterprise ideas and defend it against charges, however subtle, that it violated the

"natural" workings of the marketplace or of human nature. In this sense laissez faire was alive and kicking in the nineteenth century. But "laissez faire" is only an abstraction; it does not describe events, it classifies them. It is useful as a slogan or catch-phrase to argue the merits of a legislative proposal and as we know, it had much currency during the Industrial Revolution--indeed it still does--but it didn't prevent state involvement in personal transactions.

The second answer to our question about public health legislation and laissez faire is that even the most pristine classical economists recognized that laissez faire applied best to transactions where private profit seemed likely. Adam Smith himself had written that the state should intervene in "certain public works and certain public institutions, which it can never be for the interest of any individual or small number of individuals to erect and maintain" (Smith 1904:184-185). Any number of classical economists had come to the same conclusion. Nassau Senior, for example, after witnessing the living conditions of the poor, asked

> "What other result can be expected, when any man who can purchase or hire a plot of ground is allowed to cover it with such buildings as he may think fit, where there is no power to enforce drainage or sewerage, or to regulate the width of streets, or to prevent houses from being packed back to back, and separated in front by mere alleys and courts, or their being filled with as many inmates as their walls can contain, or the accumulation within and without, of all the impurities which arise in a crowded population?" He concluded that "with all our reverence for the principle of non-interference, we cannot doubt that in this matter it has been pushed too far. We believe that both ground landlord and the speculating builder ought to be compelled by law, though it should cost them a percentage of their rent and profit, to take measures which shall prevent the towns which they create from being centres of disease" . . . (quoted in Flinn 1965:39)

In this way the economic theorists of the time distinguished between state intervention in economic affairs and state intervention in social

affairs, agreeing that the blunt realities of life made necessary a measure of the latter. So while in the name of economic freedom a whole array of restrictive legislation was abolished--the Corn Laws being the most famous example--a new set of regulations, this time social, took their place.

Smith and Senior stand only a hair's breadth from the Marxist argument that the lack of economic regulation requires social legislation. Such a viewpoint takes a new twist in Ringan's analysis of the Public Health Law of 1848. Along with others (see, for example Hobsbawn 1964), he reasons that the New Poor Law of 1834 had to be instituted to create a work force for the industrialists and that the misery it produced rivaled any in modern history. He goes on to argue that a second piece of social legislation, the Public Health Act, became necessary in its turn to prevent the diseases engendered by the first. The "enactment of public health legislation," he says, "was merely made possible as a political reaction to the horror [the New Poor Law] inflicted upon mankind." (Ringen 1979:118).

The third point about laissez faire is that even within the economic realm, laissez faire lent itself to interpretation. It could be bent, in fact, to serve virtually any interest. Inglis (1971:82-83) notes the ease with which the Combination Acts of 1798 and 1799--prohibiting the association of either employers or workers for the purpose of effecting wages--were enforced only against the workers. It was easy for employers to "combine" in secret but nearly impossible for workers to do so.

A glance at the list of restrictive legislation on page 71 suggests that some advocates of laissez faire supported policies which violated

their principles but served their interests. To the extent that ship owners favored free enterprise, for example, they had to practice selective application when the British government began subsidizing trans-Atlantic voyages.

In fact, selective application seems to have been the rule rather than the exception. Parliament's proposals were embraced by the individuals and interest groups who stood to benefit from them and rejected by those who expected to lose. If laissez faire principles could be employed in the legislative debate, so much the better. But the real issue was not free enterprise or restrictions. The real issue was who benefits. The debate over the Public Health Law of 1848 was no exception. "The campaign for sanitary reform," says Flinn

> was not opposed by an immutable and unchallangeable principle; it was faced instead with a powerful opposition whose economic and political interests must be threatened by measures likely to reduce some incomes or diminish local autonomy. Chadwick and his supporters had to arm themselves, therefore, against the spurious use of economic and political theory which was merely the first line of defence of a group of opponents very well aware of the real nature of the threat. (Flinn 1965:42)

The fourth aspect of laissez faire pertinent to the passage of public health legislation is the idea that government is a necessary evil. The least government is best. Such a concept appealed to a middle class devoted to thrift. After all, behind all the philosophical arguments about self-seeking human nature and invisible hands lay the obvious fact that government intervention costs money. Of the values uniting the new bourgeois, efficiency and fiscal caution predominated. (Hobsbawn [1964:65-66] attributes the growth of the railroads to the desire of the newly wealthy industrialists for a place to invest their money, contrasting them with the landed oligarchs before them who had

squandered fortunes in "riotous living.") So any measures which appeared to increase cost--like government intervention--was suspect.

However, in the case of epidemic diseases, some people saw that non-intervention costs money. Among these was Edwin Chadwick, the author of, the Sanitary Report and the man sometimes called the Father of Public Health. Chadwick was as devoted as any man to nineteenth century liberalism. He had been responsible for the creation of the Poor Law Commission and his ideas formed the substance of the New Poor Law, the regulations which had transformed indigent farmers into commodities. His turning to public health was an extension of the concern that had led him to study poverty: the government expended too much money on poor relief. He hoped to reduce the number of widows and orphans the state supported by reducing the death rate among the working class. It was as straightforward as that. And the Sanitary Report appeals to its readers on exactly those grounds.

The first three chapters (plus chapter eight) tell in horrifying detail of the unsanitary conditions in which the working class lived. The piles of garbage and excrement, the overcrowding, the damp and cold, the lack of water--all are described again and again and again (Chadwick engaged a large group of investigators) until there can be no doubt in the reader's mind that conditions verged on the inhuman. From all the filth, he repeats over and over, miasmas rise up, causing disease.

The slim fourth chapter, underscoring the class nature of the problem, compares the mortality rate among "gentlemen and persons engaged in the professions and their families" with the rate for tradesmen and farmers and the rate for laborers, operative mechanics and servants.

Chapters five through seven, about half the Report, attempt to assign a cost to diseases and death. Some of the cost is to laborers, he says, because of their loss of "healthful existence and happiness" (p. 167) and the rest is cost to employers in the form of lost profits, and to the community in the form of lost produce and "expenditures for the relief of destitution which original cost (the bad ventilation) we have scientific authority for staging can be easily and economically controllable" (p. 167). In other words, spending now to get rid of foul odors will save money in the long run.

He gets as specific as he can, estimating on the basis of samples that "nearly 27,000 cases of premature widowhood and more than 100,000 cases of orphanage may be ascribed to removable causes" (p. 256). He points out long-term consequences of orphan-hood. Widows infrequently remarry, he says; they raise all their children on state money and then when the children grow up "the early familiarity with the parochial relief makes them improvident and they fall back upon the poor's rates on the lying-in of their wives, on their sickness and for aid in every emergency" (p. 256).

He shows that not only are homes unhealthy, but so are factories and mines, urging that they too should be cleaned up since "the average period of the working ability of that class might be extended at least ten years by improvements to the place of work alone" (p. 254). He also tries to show that bad character is caused by living in filth (instead of the other way around, as the lifestyle theorists believed).

He says that people living in squalor become "improvident, reckless, intemperate, and with habitual avidity for sexual gratification" (p. 423). His point is that cleaning up the slums would result in less crime and drunkenness and delinquency, and he notes, via one of his investigators, that people living and working in filthy conditions "spend their earnings weekly in the beer shop; associating with the worst of characters, they become the worst of labourers, resort to poaching, commit petty theft, and add to the county rate of commitment and prosecution" (p. 325).

In the concluding chapter, Chadwick reiterates his finding that the "noxious influences in place of work and abode" cut an average of eight to ten years "of work ability" from the laboring class, and he reminds his readers that public loss from these premature deaths is greater than would be the "pecuniary burden" of preventing them.

So the argument for sanitary reform was not a humanitarian one. Sewerage and clean water were desirable because they saved money for the rate payers and because they assured a more productive group of workers for the industrialists. Like the acceptance of the miasma theory over competing ideas, the major consideration in applying the theory was political.

* * * * *

The irony in the nineteenth century debate is that the sanitary reform it instituted--however much it was based on the selfish interests of one class and what we see now as the wrong scientific theory--was the right thing to do. It didn't work very well--fifty years later conditions in the slums in England were little changed--but nevertheless the environmental principle on which it was based was, and continues to be, the most effective approach to disease control.

One wonders what future historians will make of today's measures to control the major diseases. The environmental principle does not this time serve the dominant social class and the government institutions which the environmental hypothesis of disease causality has engendered conflict spectacularly with the still-vibrant liberal ideology. Nevertheless, many people think that future generations will look back on our age as the beginning of an environmental Renaissance. They point to such government agencies as the Occupational Safety and Health Administration (OSHA) as one of the hopeful signs. Unfortunately an investigation of OSHA, the subject of the following two chapters, does not give much support to that optimism.

CHAPTER III

THE COUNT OF OCCUPATIONAL DISEASES

In which we learn about the consequences of an environmental theory to workers

Workers: Pesticides

When I first started there my training consisted of following around this guy who was theoretically a trained professional. He learned from his brother-in-law who didn't know anything. The first day I was with him, he was mixing up a tank of Sevin, which is a carbamate. There is some evidence that it's a mutagen. He was mixing up Sevin in a big tank to spray on a yard and he was using his hand as a paddle. He says "Don't worry about it; this stuff is pretty low toxicity," but he didn't know anything about it. None of them know anything about it.

This is Linda Otten, a young woman, speaking. For the past year she has been a laborer for a Honolulu pest control company which does tent fumigation, soil poisoning and fogging to kill insects and rodents. She is one of some dozen workers I talked with about their jobs in the course of research for these two chapters. Some of these talks were brief and spontaneous; I chatted with people where I saw them. Most are reported in the following pages. The interview with Linda and the three others I include here in detail were all by appointment, tape recorded, and later edited. Each was a single session and lasted about two hours. I spoke with the two women in their homes; the two men came to my office.

The contacts for the interviews were made in two ways. Linda and Jim were referred to me by a mutual friend, John Witeck, an officer of the Public Workers Union. Both Linda and Jim had often talked with John about the health aspects of their jobs. Tom and Fran contacted me after reading a flyer* I had placed in several offices around town, including DOSH, Workers' Compensation, a couple of unions and a rehabilitation center. All four, therefore, were interviewed specifically because they thought their jobs might be making them sick.

To continue with Linda's story:

One guy, this young 18 year-old Filipino father of two kids under three, had never been told things. Once I went out with him when he was working with chlordane. The way it works you have this big pump on the truck in which you put the mixture of chlordane and heptachlor (so if one doesn't get you the other will). And this pump has a hose going

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*The flyer said:

"IF YOU KNOW WHAT IT'S LIKE TO WORK AT A JOB WHERE
FUMES OR SOLVENTS OR GASSES OR DUSTS MAY BE
MAKING PEOPLE SICK, PLEASE CALL OR WRITE ME.
I AM STUDYING OCCUPATIONAL DISEASES IN HAWAII
IN ORDER TO HELP IMPROVE CONDITIONS IN THE WORKPLACE.
YOU CAN HELP BY TELLING ABOUT YOUR EXPERIENCES.
OF COURSE ALL PERSONAL INFORMATION WILL BE KEPT
CONFIDENTIAL."

out and a sort of drill at the end of the hose, to drill through the concrete. The drill head was leaking and the liquid was getting all over the place. So Eddy was using old towels and rags to sop it up, with his bare hands. In between drilling he would rest the drill on his tennis shoe which soon became thoroughly drenched. And then he was starting to sweat so he was wiping his face off with his chlordane-drenched hands. And all I could do was say, "Eddy you should be more careful." But no matter what I would say it would be just regarded as humorous. Apparently this went on all the time. He said the drill had been leaking as long as he'd been there.

Chlordane and heptachlor are two closely related organochlorine pesticides manufactured by the Velsicol Chemical Company in Chicago. Since 1974 these pesticides have been the subject of a running battle between the company and several government regulatory agencies over their carcinogenicity. Velsicol's own studies, finding the pesticides safe, have been challenged by government studies showing them to be carcinogenic in mice and accordingly, a cancer hazard to humans.

> Over the last twenty years there has been an accumulation of scattered reports of aplastic anaemia and leukaemia, besides other malignant diseases in humans exposed to chlordane and heptachlor, under a wide range of conditions. There have also been recent reports of cancer and leukaemia in infants and young children born to mothers exposed to chlordane during pregnancy following house-proofing for termites. (Epstein, 1978:275)

The company I'm with get a lot of their chemicals from Australia by extra-legal means. They were using things like dieldrin which is banned in California. I'm not sure what the status is here. My company used dieldrin a lot. They had this mixture called DFO, combining dieldrin and ether and something else and they used it for spot treatment of

pests. The company also had this powder that they use which I know is illegal. It contains arsenic.

The carcinogenicity of dieldrin was established in animal tests by the FDA in 1962 and the substance was banned for use in the United States in 1976 on the grounds of imminent carcinogenic hazard (Epstein, 1978:269).

> Arsenic compounds may cause heart disease; exposed persons often show abnormal electrocardiograms. Arsenic affects the nerves of the hands and feet, resulting in loss of sensation, pain and a feeling of weakness. Exposed workers may also develop serious anemia. Arsenic causes skin cancers at areas of local contact. Dust and fume exposure can lead to lung cancer, which appears after more than 20 years of exposure. (Stellman and Daum, 1973:245)

Everybody who works there has a hacking cough but I don't know if it's associated with the chemicals because they all smoke. There just seems to be a real low level of health consciousnesses. . . . The boss and one of the guys who's been in the business for 20 years both have skin cancer on the backs of their hands . . . I don't know what to attribute that to, but I asked about it and the boss said that he doesn't really worry about it because if you get one kind of cancer it prevents you from getting another . . .

Sometimes the equipment backfires. One day for instance I was totally drenched with Sevin, head to foot, and had to wear these Sevin-drenched clothes for two hours before I could take a shower and change.

Sevin is a pesticide made by the Chevron Chemical Company. OSHA regulations list a threshold limit of 5 miligrams per cubic meter of air for its active indredient, Carbaryl (1-naphthyl N-methylcarbamate). The label on Sevin reads:

> CAUTION: HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH THE SKIN. Avoid Breathing Dust or Spray. Do Not Take Internally. Skin Contact May Be Harmful. Avoid Contact. Wash Hands and Face Before Eating. Take Shower or Bath After Work. Wear Regular Long Sleeved Work Clothing. Change to Clean Clothing Daily.

The chemicals which they use now are Vicane, which is sulfaryl flouride, I think. It says, right on the label that you should use protecting clothing, which is long sleeved shirts, long pants, gloves, a full-faced respirator. But they never wear that. Too hot they say. So they're out there wearing shorts and no tops. I've never seen them wear gloves. The respirators they have are kind of a joke because they don't bother to change the cartridges often enough. You're supposed to change the cartridges every 20 minutes. Well, they probably get changed every two months or something. The problem is they sweat. It's hot heavy, hard work, and the sweat in itself tends to make the stuff more absorbent in the skin because it's water soluble. The greatest time of exposure comes during the untenting because that's when there's the greatest concentration of gas . . . Vicane is odorless. . . You must put in chloropicarine which has a real strong odor. There is a law that says you have to use it, but often they don't because they run out or don't bother and do the job anyway. These laws are broken all the time. The men complain about the chloropicarine because it stinks. It doesn't occur to them that it's a safety feature.

Our company was supplied by Namco, which I think supplies lots of companies. This distributing company offers little seminars sporadically, billed as education. But they're really shoddy and they end up with a pep talk about using the latest equipment and product . . . It's not

a little course in chemistry. Maybe there's a 15 minute lecture on chemistry someplace, but I've never heard of that. You do learn how to use a fumascope, but in general you're tested on your knowledge of business . . . The emphasis is on business law, business ethics, with very little about biology or safety.

What can be done? I'd like to see the agencies that are supposed to regulate this stuff have the funds to really do that. And there should be people to educate the workers. When I'd don my little mask and my gloves there was a lot of snickering. I couldn't tell them; I was such an oddity anyway, eating carrots for lunch . . . .

The agency that is supposed to regulate this stuff is the Occupational Safety and Health Administration (OSHA), established in December 1970 as a branch of the U.S. Department of Labor to "assure so far as possible every working man and woman in the Nation safe and healthful working conditions and to preserve our human resources . . ." (OSHA Act, page 1). A second agency, The National Institute for Occupational Health and Safety (NIOSH), located within the Department of Health and Human Services, is supposed to aid OSHA by developing and recommending occupational safety and health standards. NIOSH is primarily a research institute.

The establishing act "encourag(es) the States to assume the fullest responsibility for the administration and enforcement of their occupational safety and health laws by providing grants to the States" (OSHAct, p. 2). Hawaii is one of twenty-three states with its own occupational safety and health program. The agency here, under the state Department of Labor and Industrial Relations, called the Division of Occupational

Safety and Health (DOSH) became operational in March 1974. Neither the state nor the federal agency is lavishly funded. Both, in fact, are in more or less continual danger of having their funding cut out altogether. However, it is not primarily funding constraints which prevent OSHA and DOSH from regulating occupational toxins. The constraints are at a more fundamental level. In order to understand them it is helpful to get the story of occupational health from several different points of view. Let us continue to listen to some workers.

Workers: Asbestos

Unlike pesticides in home use, which have roused virtually no public interest in Hawaii, asbestos scares everybody. When in April 1978 HEW Secretary Califano warned that eight to eleven million Americans have been exposed to this deadly material, the Honolulu newspapers began to run stories about the dangers of lung cancer, asbestosis and mesothelioma faced by the 10,000 current and former shipyard workers at Pearl Harbor. In general the articles indicated Navy officials for inadequate protection and education of asbestos workers. The following November U.S. Representative Cecil Heftel chaired a two-day Congressional hearing of the House Education and Labor Committee's subcommittee on compensation, health and safety in Honolulu resulting in, among other things, a fresh onslaught of media publicity about the health hazards of asbestos, and charges and counter charges regarding responsibility for protecting workers.

Asbestos is not only an occupational hazard for shipyard workers, but also for insulation workers, textile workers, construction workers, and anybody who works with brakes. The newspaper publicity and the

Congressional hearings have had varying effects on these men. At least one is very angry. I talked with him, a young man named Tom Mountain, about a year after the Pearl Harbor hearings.

In March 1976 I started working for the Wailua Sugar Company as a heavy equipment operator . . . cranes, cane haul trucks, bulldozers. I came under a lot of exposure to asbestos dust because the cranes have big brakes with huge brake shoes about 10 inches across by 2-1/2 feet long. Each crane has about 40 of these brake shoes . . . These brakes on these cranes and on the tractors too are asbestos; it's all asbestos . . . We're constantly working with the stuff. See the company buys these big blanks of asbestos and we cut them to fit the metal for the big brake shoes. We drill holes in them and all. Each shop has a riveter machine and it's used regularly and all around there's asbestos dust, as much as an inch of asbestos dust in about a 10-foot diameter circle, fading off to maybe an eighth of an inch. It's been that way for maybe 20 years.

In about March or April of 1978 OSHA started getting interested in asbestos. About then they [the company, not OSHA] *issued breather masks. Before that only a few people had worn them. Initially, they were those little cloth masks, then they went into the bigger ones later on . . . Then they got strict about them, but still you'd have guys working a couple of feet away from one another and only one would be required to wear a mask. . . .What really happened is when the big scare came out in Pearl Harbor. Then everyone began wearing masks. Until that point you could talk all you wanted and nothing ever happened. I distinctly*

remember once when, the day before an OSHA inspector was coming out, everyone was running around because they knew they were going to get fined because there's no way they can clean up everything. So they're putting these big rolls of various thicknesses of asbestos into big plastic bags. And they have to get rid of this riveter machine with all the asbestos dust around. So they hid it out in the shed and swept up all the dust and put it in a bin and put it away.*

[Q: Did the guys who swept wear a mask or anything?] A: (skoffing) *Noooooooo.* [Q: How did you know the inspector was coming? That's supposed to be unannounced.] A: *Because the foreman told us. It's supposed to be a secret, right? But everyone knows the inspector is coming. Everybody always knows when OSHA's coming.*

. . . I got worried about this asbestos stuff from reading. And I'd come home every day with asbestos in my clothes, my socks. I've got hairy arms and it'd be stuck to my arms. And I was worried. My baby plays around the floor . . . [Q: How many other guys besides you were worried about health stuff?] A: *Oh everyone in there has so many problems, asbestos problems aren't too important. I did ask how come we don't get all the special suits and breather masks like the guys at Pearl Harbor who have to work with asbestos. And they said it costs too much money. We lost a million dollars last year.* [Q: Someone actually said that?] A: *Yeah, the supervisor said that, in front of all the men at a health and safety meeting. . . . We're supposed to have a health*

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*He means DOSH; OSHA only inspects federal installations and the maritime industry in Hawaii. OSHA also monitors DOSH by making spot-checks on local businesses and industries but they don't assess fines; they simply file reports.

and safety meeting once a month. The foreman comes around early in the morning. "Let's have a safety meeting. Anybody have any suggestions?" So then they say, "Let's be more careful about leaving scraps of metal around" or "Let's be more safe" . . .

I worked on the plantation 40 months. During that time OSHA came around about once a year. Maybe three times. An inspection lasted usually a day. One guy would come around. They take him around and he'd look at this and look at that. [Q: Did you know whether he was a safety man or a health man?] A: *We never knew. They never thought to introduce us . . .* [Q: Who was the guy who represented labor at the walkaround?] A: *Oh, the shop steward, just one of the ordinary guys. He got elected at a meeting but anyone who turned up at the meeting could get elected. The only way to get people to turn up for elections was to give out hams. Twenty dollar hams they'd give out. The union would give everyone a ham, but you had to come out to vote to get your ham.*

A few days after the conversation with Tom, I telephoned one of the DOSH administrators I interviewed before. "I was just talking with a fellow who works on one of the plantations and he said they always know when your inspectors are coming. How would they know that?"

"Oh, in big outfits these inspections can last several days. The inspectors start at one place and it takes them a while to get to every operation. So people know they're on the premises."

Workers: Hydrogen Sulfide

Not long after meeting Tom, I had a series of interviews with sewer workers. One hazard for these workers is hydrogen sulfide, a gas

which forms as sewage decomposes. It smells like rotten eggs. At low levels H2S irritates the eyes and the upper respiratory tract and is one of the chemicals which causes pulmonary edema, a condition brought on by damaged, fluid-filled lungs. Long-term exposure can cause chronic lung disease. Very high levels of H2S--over 700 parts per million--can build up in enclosed sewer pipes or treatment plants and at these levels the gas can suffocate a person in a matter of minutes. Incredibly, not all sewer workers know this. Charlie, the man in charge of the Honolulu sewage treatment plant, told me that a lot of H2S is produced by sewage. But, he says, "That's not dangerous. The other gases really are, though." This comment from a man who has been working around sewage for years so surprised me that I drove back to the plant the following week to make sure I had heard him right. He reaffirmed his position. "Hydrogen sulfide isn't dangerous. It just has a bad smell."

I had met Charlie during a day's tour with Mr. Silva, a former operator, now a supervisor at the Wastewater Management Division of the City and County of Honolulu's Public Works Department. Mr. Silva, eager to have me understand that sewer workers have dangerous jobs, took me to an 80-foot deep manhole on a residential street in Kaimuki. (He had wanted me to see a famous 127-foot manhole but we found it sealed.) Pulling a long metal rod from the truck, Mr. Silva managed to pry the heavy lid from the 80-foot manhole, bending the two inch rod in the process. I peered way down into the black hole, hearing the rushing water below before I caught glints of sun off its surface. The hole is five feet in diameter. Heavy metal rungs lead down to the bottom, most of them nearly eaten through by the sewer gases. Mr. Silva told me that

now sewer cleaners have to be lowered down these old manholes in slings, constantly in danger of bumping against the sides and thus turning over. It is very scarey down there, he says. Before you enter a section of the sewer you open another manhole a few blocks away and put a big blower down to clean out the air. Then you send down instruments to test it before daring to enter yourself. You clean sewers by walking along the line, bent over to accommodate the five foot diameter, swishing a broom in an arc over your head. Every few steps you dip the broom into the sewage which is rushing along at thigh level. The sludge and water drip into your face. I was appropriately repelled by this description, thus pleasing Mr. Silva no end. His eyes sparkled and he imitated the cleaning motions again. When you walk from one manhole to the other, he said, the coins in your pocket turn black. "If the gas does that to your coins," he said proudly, "imagine what it does to your lungs."

Actually, the health effects of sewage work are not clear. A few years ago the Hawaii State Legislature commissioned a study of sewer workers' diseases which was inconclusive (Root and Kim 1977). Nevertheless, and surely to some extent because of an intuitive feeling that it must be unhealthy to work with sewage, the health issue keeps coming up. In the past year--since the summer of 1979--the question of hydrogen sulfide at the city's new Sand Island sewage treatment plant (or wastewater treatment plant as it is officially labeled) has occupied a handful of operators at Sand Island, their supervisors and DOSH.

The trouble centers around the five enormous Flotation-Clarification (F-C) tanks in which sewage which has already passed through the initial bar screen is slowly stirred by huge mechanical devices to remove the

major portion of the remaining solid wastes. Working adequately when first put into operation in September 1978, the F-C tanks began to collect unexpectedly high levels of hydrogen sulfide six months later. According to the United Public Workers' monthly newspaper The Organizer, in late March a Sand Island operator filed a complaint with DOSH, asking them to inspect the F-C tanks on the basis that a number of workers had been experiencing "dizziness, respiratory illnesses, chest pains, coughing, and diarrhea." The DOSH inspector produced no evidence of high levels of H2S. "However, some time later, the Federal OSHA people conducted a spot-check of the site and discovered through a grab-bag sample, a hydrogen sulfide rough reading of 48 parts per million, when over 20 parts per million is a serious hazard and even 10 parts per million* over an extended time could be enough for a violation of existing standards" (The Organizer, July 1979, p. 6). Following the OSHA inspection, chains were hung across the entry ways to the tanks with a little chalk board on which the H2S readings could be noted several times a day.

But the warning signs were to be only temporary measures. Workers must frequently enter the tanks to check equipment and the plant was supposed to be designed to keep the H2S levels low enough so that they can enter safely any time.

In September, hearing of my interest in occupational health, Jim Sands, another operator, called me to report that H2S levels

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*Actually, the federal standard is a ceiling level of 20 parts per million. NIOSH, 1977:923.

continued to be very high and no one seemed to be doing anything about it.

Later, in a long conversation with me he labeled DOSH "weak and ineffective," saying a health inspector "came down in response to a complaint and it turned out that his H2S reading was inaccurate. He didn't know how to calibrate it and it took him a week just to get his meter working . . . Then OSHA* gave management something like four weeks to put out a memo on H2S hazards."

"What did the memo say?" I asked.

"It said really important things like the color of H2S when it's frozen." And he laughed.

Because Section 7(b) of the Hawaii Occupational Safety and Health Law states "All employers shall promptly post information regarding hazards in his [sic] workplace including information about suitable precautions, relevant symptoms and emergency treatment in case of exposure . . ." I asked, "Did the memo tell you what the physical effects are of exposure?"

"No, as a matter of fact it didn't."

I pressed him. "Nothing about that at all?"

"Correct . . . I recognized a lot of symptoms in your book [by Stellman and Daum, which he had just read] like dizziness and diarrhea that a lot of men have complained about, and I didn't know it could be from H2S."

Jim also said that the plant manager told him that management had known for some time that the H2S level was above DOSH standards but they

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*He meant DOSH.

didn't do anything about it for a long time. "I'd say at least two weeks. And then after management did take those atmospheric sulfide readings and did find out that they were high they still didn't come back and warn any of the operators for over another week. So that was three weeks, during which they knew it was hazardous but they were talking among themselves about what to do. But finally they began putting signs up on the F-C."

"Are people following the signs because they're worrying about their own exposure or because they're just following the rules?"

"Following the rules. A few men are concerned about their health. The rest think they're made out of cast iron."

Workers: Automobile Exhausts

Some workers who suspect their jobs are making them sick, simply quit. Fran Grant, a pleasant woman in her fifties, walked out on a position she'd held for a year after repeated bouts of illness convinced her the job was hazardous.

I worked part time for Hertz Rent-a-car and I worked as a shuttle driver. The responsibility of this driver is to pick up the car that has been used at the hotel or the airport, wherever they drop the car off, and return it to the garage so that it goes through the washing machine and it's totally checked mechanically.

The garage is downstairs in the basement [of Hemmeter Center]. *They have large fans down there and it's shared with another rental agency, Budget Rental. And this was when I began to experience some adverse physical kinds of things. I found that when we were waiting*

between calls from hotels to pick up a car . . . I would have nausea periodically. And I suppose it's an allergy that you build. You always have a stuffy head. . . . I frequently had a stuffy head and it hit my stomach . . .

I kept getting sicker and sicker and sicker. As long as we were outside and driving with the windows open I was alright but the more time we spent down there, the more confinement, I was in the noxious fumes from the exhaust and the gasoline and . . . [Q: Could you smell the fumes?] A: *Oh, I could smell them, I could taste them, I was injesting them. And more than once I lost my breakfast. I wasn't holding my food. The last time that this happened I had been driving in the morning but it had hit me so badly I knew I was going to be ill. A friend came and picked me up instead of my taking the bus home . . . And . . . I absolutely retched. My stomach just turned over. And I was literally ill and off work for a full week. And I told them I was resigning; I couldn't take it.*

According to NIOSH, garage workers (a category which evidently includes both automobile mechanics and drivers like Fran) are exposed to gasoline and gasoline additives, among other toxins (NIOSH 1977:92). Stellman and Daum point out that carbon monoxide is another occupational toxin of garage workers.

"Gasoline vapor," says NIOSH, "acts as a central nervous system depressant. Exposure to low concentrations may produce flushing of the face, staggering gait, slurred speech and mental confusion" (p. 140). But it is the anti-knock additive to gasoline which may be especially pertinent to this case. One such additive, Ethylene dichloride, inhaled

in high concentration "may cause nausea, vomiting, mental confusion, dizziness and pulmonary edema" (p. 200). Bromine, another additive "is corrosive to the mucuous membranes of the nasopharynx and upper respiratory tract . . . exposure to low concentration results in cough, copious mucuous secretions, nose bleeds, respiratory difficulty, vertigo and headache. Usually these symptoms are followed by nausea, diarrhea, abdominal distress, hoarseness and asthmatic type respiratory difficulty" (pp. 314-315).

Prolonged exposure to ethylene dichloride, another gasoline additive, "has been found to injure the liver and kidneys and adrenal glands . . . It irritates the eyes and upper respiratory tract and . . . also causes nausea and vomiting" (Stellman and Daum, p. 205). As for carbon monoxide, "The first . . . symptom is headache. Further exposure causes throbbing headache, reddening of the skin, weakness, dizziness, dimness of vision, nausea, vomiting . . . " (Stellman and Daum, p. 165).

My health went down very markedly during that time. After you're a while like that you're not thinking as clearly. When you're not feeling well you're not giving it your all. You're slowed down in your transportation, you're slowed down in your reports. The response from the office was, well other people are down there and they're not having these reactions. [Q: So you talked about this with, um ----] A: *OH, I talked about it with the office upstairs, the manager's office. And, they had the uh, one of the city departments come in and check the fan and check the content of the air. And it was within some kind of a norm. It was borderline.* [Q: After they did the inspection, did you get some feedback about what the inspectors had found?] A: *No, they*

said that before I complained that somebody else had complained and they had called this state department to come out and make this check and the check found it kind of borderline. [Q: So they didn't call the inspectors back especially for you?] A: *No, they did not.* [Q: Nor did they tell you that you had the right to call some one?] A: *No, and I was a part-time worker and I went in with the understanding that I was part-time and that I didn't have any privileges.*

[Q: Did you ever go to a doctor about all of this?] A: *Oh, no . . . when I don't feel well I won't go to a doctor. It's too much effort at that point . . . And I really felt that that was the time to leave instead of bucking all the ill-will . . . we had been really close team members but all of a sudden* [when] *I became a crew leader* [they] *were out to get me . . . They couldn't stand somebody else getting the promotion . . . They did little sabotage acts . . .* [Q: So you were glad to get out, in a sense.] A: *Oh yeah, yeah. And they were glad to get rid of me. There's no point in being in a place of resentment . . .* [Q: Well, if you hadn't been so eager to leave, would you have applied for workers' comp?] A: *I was only working half time; I didn't have workers' comp. . .*

She is misinformed here. Part-time workers are not excluded from Workers' Compensation. By law, any worker who becomes sick from occupational toxins is entitled to medical expenses and two-thirds of missed wages. To get compensation, Fran would have had to go to a doctor, however. Some of the drawbacks to Workers' Compensation are discussed at the end of this chapter.

[Q: All the time when you were feeling sick, what was the attitude of the other workers? Were they aware that it might be a dangerous place to work in?] A: *No, there wasn't that kind of concern. The only concern was for checks and paydays.* [Q: And none of them to your knowledge were experiencing the same kind of health effects?] A: *No.*

Numbers

By their own account these workers are exceptional in their concern about occupational health hazards. They see their fellow workers as uninformed about toxins or trusting of their supervisors or distracted by other kinds of problems, or too dependent on their jobs to raise questions, or as enjoying a sense of bravado in the face of possible danger. These more complacent workers may, of course, be right. None of the worried workers has learned about occupational health hazards directly from management or labor unions or regulatory agencies. The information these men and women have has been gleaned from general reading (except for the pest control worker who has a college degree in chemistry), most of which could be construed as applying only to the Mainland. Thinking that not only their fears about occupational disease but my own concern for the health of workers might be misplaced, I set out to discover how many workers in Hawaii have become ill or died because of occupational toxins, which workplaces are the most dangerous, what chemicals they use and how many people are exposed. I wanted to compare Hawaii with the rest of the nation.

I began by looking into the dubious notion--widely accepted in Hawaii --that one's experiences here are somehow different from those of other Americans. You hear it everyplace. For example, Dr. Lawrence Kolonel, director of epidemiology for the Hawaii Cancer Center was quoted in the Honolulu Advertiser as saying there are few occupational diseases here (Advertiser, 9/2/79). When I telephoned to ask him the basis for his

statement he said, "Oh, it's just that we have very little heavy industry--no more reason than that."

A lack of heavy industry and the presence of the tradewinds--these are the two reasons generally cited as evidence for the supposed exceptionally low level of occupational disease in Hawaii. However, a comparison of the Hawaii workforce with the total U.S. workforce suggests that in all categories but two, Hawaii's workers are distributed by occupation almost identically to the U.S. as a whole. The differences bear inspection. Eleven and four-tenths percent of all U.S. workers are operatives while only 6.6 percent of Hawaii's workers are. And 17.3 percent of Hawaii workers are service workers while only 13.7 percent of all U.S. workers are. A partial breakdown of these categories appears in Table 1. (It includes all the principal service workers categories, while for operatives, a more varied classification, only those jobs are listed in which more than 1 percent of the workforce, either in Hawaii or on the Mainland, is employed.)

Among the operatives, the two job categories in which the U.S. as a whole has a considerably higher percentage are assemblers, and manufacturing checkers, examiners and inspectors. These two categories combined make up 17.5 percent of U.S. operatives, compared to 1.94 percent of Hawaii's operatives. Eliminating them from the operative category would not significantly alter the unequal percentage of operatives in Hawaii compared to the Mainland, so it is not the small amount of manufacturing alone which accounts for the small percentage of operatives in Hawaii. Instead, the major difference is that a smaller percentage of people work at all jobs in that category. We cannot conclude from this that there are fewer occupational diseases in Hawaii however, until we know what toxins are employed in each job.

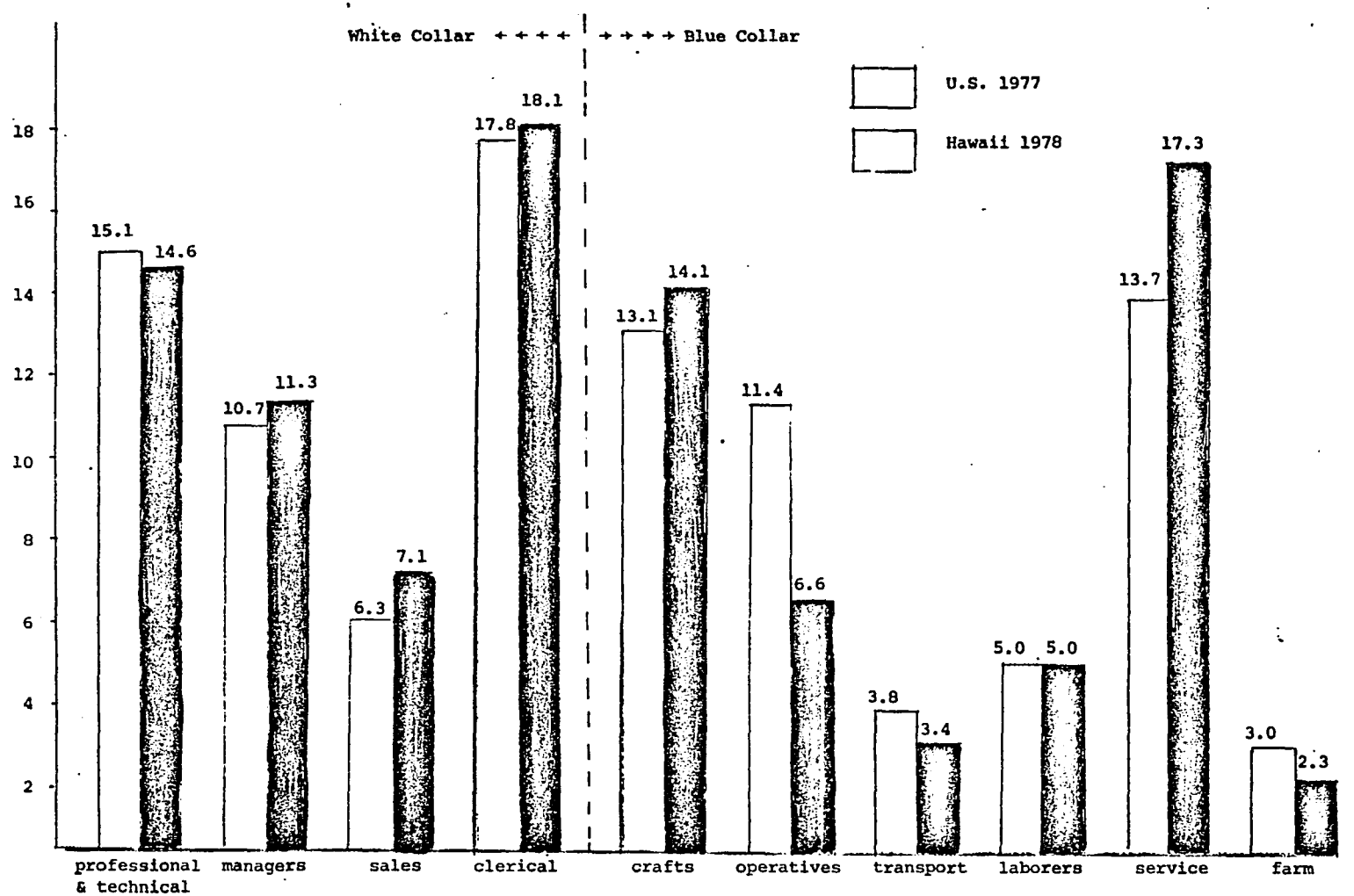

Figure 1. Comparison of Hawaii and U.S. Workforce by Occupational Category

Data from: Handbook of Labor Statistics 1978, U.S. Dept. of Labor, Bureau of Labor Statistics, 1979, Bulletin 2000, Table 19; Job Scene 1985; State of Hawaii, Dept. of Labor and Industrial Relations, September 1978, Table A-2.

Table 1

Comparison of U.S. and Hawaii Workforce
in Two Categories of Occupation

	# employed U.S. 1977 (in thousands)	% of total	# employed Hawaii 1978	% of total
Operatives				
Assemblers	1,136	10.97	240	0.94
Bottling and canning operatives	54	.52	380	1.49
Checkers, examiners & inspectors, manufacturing	684	6.60	280	1.09
Dressmakers, exc. factory	119	1.14	1,140	4.47
Drywall installers and lathers	77	0.74	810	3.18
Garage workers and gas station attendants	427	4.12	2,700	10.60
Laundry and dry cleaning operators	165	1.59	980	3.84
Meat cutters and butchers, excluding manufacturing	187	1.80	740	2.90
Mine operatives	200	1.93	--	--
Packers and wrappers, exc. meat, produce	610	5.89	2,020	7.93
Painter, manufactured articles	152	1.46	390	1.53
Photographic process workers	83	.80	280	1.09
Precision machine operatives	372	3.50	--	--
Sewers and stitchers	820	7.91	2,760	10.84
Welders and flame cutters	639	6.17	2,670	10.48
Miscellaneous machine operatives	--	--	2,210	8.68
Operatives N.C.C.	--	--	4,550	17.87
all other operatives	2,849	27.5	--	--
Service				
Private household	1,158	9.34	1,610	2.42
Cleaning service workers	2,363	19.6	13,880	20.87
Food service	3,919	39.40	30,620	46.05
Health service	1,747	14.09	4,750	7.14
Personal service	1,705	13.74	9,880	14.86
Protective service	1,324	26.14	5,740	8.63

Source: Handbook of Labor Statistics 1978, U.S. Dept. of Labor, Bureau of Labor Statistics, 1979, Bulletin 2000, Table 19. Job Scene 1985; State of Hawaii, Dept. of Labor and Industrial Relations, September 1978, Table A-2.

Similarly, the fact that there are proportionally more service workers here than in the U.S. generally does not lead to any conclusion about occupational disease unless we know what toxins service workers may be exposed to.

For this reason I decided to ignore these differences and assume that the Hawaii workforce is similar to the rest of the nation and see if I could make some estimates regarding numbers of diseases and deaths attributable to occupational exposure in the Islands.

Soon after its formation NIOSH announced via the "President's Report on Occupational Safety and Health for 1971" that 390,000 diseases and 100,000 deaths in the U.S. each year are due to occupational toxins, figures which have been widely repeated, showing up in virtually all serious discussions of occupational health in the past nine years. They are, of course, only estimates and extrapolating from them to make estimates for Hawaii results in similarly general figures. There are about 80 million workers in the U.S. as a whole and about 367,000 workers in Hawaii. Some 47,000 of Hawaii workers work at more than one job, for the Hawaii job count for 1978 was 414,000 (Hawaii DPED 1979:181). Taking the more conservative lower number, however (367,000 workers) and comparing it to the NIOSH figures, one arrives at an estimate of 1,789 occupational diseases annually in Hawaii and 458 occupational deaths.

These HEW estimates are not very helpful, however. In the first place, to say there are 390,000 occupational diseases and 100,000 occupational deaths is peculiar, for a ratio of nearly 4:1 diseases to deaths is inconsistent with morbidity and mortality data in general. For example, in Hawaii the report of the 1974-76 Health Surveillance program

states an incidence of 1,661,300 acute illnesses (Hawaii, Dept. of Health, 1976:59) and shows 507,020 chronic conditions (p. 63). The total of these numbers is 2,168,320. In 1976 there were 4,719 deaths in Hawaii (p. 23). If we subtract those due to accident, homicide and suicide, we are left with 4,250 deaths due to disease. That number is only 0.19 percent of 2,168,320. In other words, in Hawaii the ratio of diseases to deaths is 510:1. One wonders where HEW got their much quoted statistics. In fact, HEW seems to be wondering too.

In a letter to me dated August 22, 1979, Todd M. Frazier, the chief of the Surveillance Branch Division of Surveillance, Hazard Evaluation and Field Studies of NISOH wrote:

> The estimate of 390,000 occupational illnesses was derived by projecting estimates obtained through the California First Reports. Unfortunately, the original methodology and work sheets are not available, and we have not attempted to duplicate the procedure to arrive at the figure cited.

Mr. Frazier enclosed a copy of what appears to be an inter-office memo dated November 3, 1977 and addressed to the NIOSH Public Information Office which says in part "The 390,000 was probably estimated by Doug Williams when he was on the staff of Vern Rose. Pierre Decoufle also may have had some input. Unfortunately, they never kept the actual methodology and work sheets that were utilized." With such flimsy, even nonexistent, justification for the estimate, NIOSH has been seriously negligent in not funding a second statistical study. Without accurate figures on current occupational illnesses it is impossible to determine the effectiveness of either OSHA or DOSH programs.

Another reason to question the NIOSH estimates comes from a comparison of the number of occupational diseases reported in Hawaii with

the number expected, using the 390,000 figure. In 1976 Hawaii workers reported 2,174 occupational diseases to Workers' Compensation. This is 385 more than would be predicted. Given the fact that occupational disease is notoriously underreported (one study found only 3 percent of occupational disease reported to Workers' Compensation (Ashford 1976:11) the 2,174 "official" occupational diseases in Hawaii bear scrutiny. Perhaps in Hawaii an extremely wide range of diseases, including many chronic illnesses with long latency periods are, for some reason, reported to Workers' Compensation. But such is not the case, as Table 2 shows, 77 percent of the reported illnesses in 1976 were injuries to the eyes or skin rashes, the most commonly reported occupational diseases in the country in general because they are relatively easy to link to occupation. There were very few respiratory illnesses, no cancers, and a lower number of cardiovascular diseases than one would expect from such reports on occupational diseases as Stellman and Daum's book or the fat HEW publication, Occupational Diseases. Clearly, the numbers of diseases would be considerably higher were illnesses with less clear-cut relation to occupation included. In other words, rather than concluding that Hawaii workers over-report disease, it is more logical to consider that the number of diseases predicted for Hawaii on the basis of 390,000 nationwide, is too small and therefore that there are considerably more than 390,000 occupational diseases annually in the U.S.

The NIOSH estimate of 100,000 deaths due to occupational diseases is more carefully documented. Mr. Frazier included in his letter the following explanation.

Table 2

Reported Accidents for 1976

	Number	Percent Distribution
NATURE OF INJURY	38,721	100.0%
Strains, Hernias, Dislocations	11,163	28.8
Cuts, Lacerations, Punctures	10,699	27.6
Bruises, Contusions	8,758	22.6
Foreign Bodies	2,550	6.6
Occupational Diseases	2,174	5.6
Burns, Scalds	1,957	5.1
Fractures	1,170	3.0
Concussions	137	0.4
Amputations (Traumatic & Surgical)	65	0.2
All other Injuries	48	0.1
OCCUPATIONAL DISEASES	2,174	100.0%
Retinitis-Conjunctivitis	876	40.3
Dermatitis-Allergy-Sensitivity	798	36.7
Virus	126	5.8
Respiratory	96	4.4
Bursitis	79	3.7
Cardio-Vascular	79	3.7
Blisters	35	1.6
Poisoning	29	1.3
Abdominal-Gastritis-Enteritis	15	0.7
Psychiatric-Psychosis	11	0.5
Hernia	9	0.4
Colds-Over Exposure	7	0.3
Tuberculosis	7	0.3
Amoeba-Salmonella	6	0.3
Radiation	1	*

*Less than one-tenth of one percent.

Source: Workers' Compensation in Hawaii 1976, State of Hawaii, Dept. of Labor and Industrial Relations, p. 23.

Method Utilized by the Office of Occupational Health Surveillance and Biometrics to Estimate the Annual Number of Deaths from Occupational Disease

> The approach taken to arrive at this estimate consisted of examining overall mortality rates for persons employed in a wide variety of occupations, and relating them to the mortality rate of the general population, taking into consideration age and relative socio-economic level. The data source utilized in the process was the 1951 Registrar-General's Occupational Mortality Report for England and Wales which is the only source currently available with sufficiently detailed information. From this compendium, occupational groups whose mortality rates were greater than the general population rate (after adjustment for age and social class) were counted as having an excess death rate attributable to the environment in which they worked. The number of deaths over and above those which would have been expected on the basis of age and social class were summed over all occupations and treated as occupational disease deaths. This figure was then divided by the total number of employed persons to form an occupational disease death rate. To estimate the number of occupational disease deaths that might be expected annually in this country, this rate was applied to a recent estimate of the number of employed persons in the United States. The result of this procedure yielded an estimate of 75,000. If one ignores social class in the calculations, the estimate would be 100,000.*

Other writers, critical of the 390,000 figure for occupational disease tend to accept the 100,000 occupational disease death estimate as more plausible. (See, for example, Berman 1978.) If the figure is reliable, it exposes a serious under-reporting of occupational disease deaths in Hawaii. Extrapolating from the 100,000 figure, one would expect some 458 occupational deaths here annually. In fact, the most recent, and highest, figure reported was 18 (for 1976): seventeen deaths from heart failure or stroke, one from respiratory diseases (Hawaii DLIR 1976).

As for occupational diseases, other NIOSH morbidity estimates suggest far higher numbers of occupational diseases than 390,000. Between 1972-74 NIOSH sponsored a University of Washington study in Seattle and

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*Undated material; prepared by DHEW, National Institute for Occupational Safety and Health.

Portland in which physical examinations were made on 985,000 workers in businesses employing 8 to 150 people. The study found 28.4 occupational diseases for every 100 workers (New York Times 4/28/75; 27:2). If we were to assume that these figures are relevant to Hawaii and that everyone here works in businesses employing less than 150 people,* we would then guess there are 104,228 occupational diseases annually.

Or we could take the finding that three of every ten factory and farm workers suffer an occupational disease every year, another estimate coming from the University of Washington study (New York Times 5/12/75; 28:1) and say that of the 8,840** farmers and farm workers here 2,652 contract an occupational disease every year. And of Hawaii's 2,210 "miscellaneous machine operators" 663 of them become ill each year due to their occupations. The 240 assemblers would have 72 occupational diseases and the 280 manufacturing checkers might have 84. The total number from this small category of jobs would be 3,471.

The University of Washington study also has its drawbacks, however. The physical exams disclosed 1,116 medical conditions, of which 31 percent were occupationally related. Of that 31 percent, 28 percent were due to hearing loss, 18 percent were skin conditions, 25 percent were respiratory illnesses, 14 percent were non-symptomatic conditions such as elevated lead levels in the flood, 9 percent were conjunctivitis and other eye conditions, and 6 percent fell into the miscellaneous category

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*Actually, according to DLIR estimates, around half of workers here work in businesses with less than 150 people, for the job count in these businesses is 178,850 (personal communication, Research Statistics, DLIR).

**All figures come from the only Hawaii government publication to give figures on occupation, Job Scene 1985, State of Hawaii, Department of Labor and Industrial Relations, September 1978.

including anemia and diseases of the muscular, skeletal or connective tissue (New York Times, 5/12/75).

In a sense the figures are too low because the University of Washington only studied employed people, so did not count men and women with long-latency diseases such as cancer or cardiovascular disease which don't manifest themselves until after retirement, nor did it count younger people too sick to work. And in another sense the figure is too high because it includes so many relatively trivial and obvious disorders. The occupational diseases of real concern are those that are life-threatening and hidden.

One other major estimate of occupational disease bears comparison with Hawaii data. There may be as many as 578 cancers in Hawaii due to occupational exposure, for there were 2,890 malignant neoplams recorded in the 1974-76 Hawaii Health Survey (Statistical Report, State of Hawaii, 1976, p. 59) and NIOSH has estimated that 20 percent of all cancers are occupational.

(One wonders if anyone has reconciled this estimate with the calculation of 100,000 occupational deaths per year. The overall death rate from cancer in the U.S. is 176 per 100,000 [DHEW 1978:169] or--for a population of 225,000,000--396,000 cancer deaths. If 20 percent of cancers are occupational, and all of those occupational cancers ended in deaths we would expect that of the 100,000 occupational cancer deaths a year, 79,200 would be for cancer, leaving only 20,800 deaths due to other occupational disease. If only half of occupational cancers ended in death, it still means that over a third of all

occupational deaths (39,600) are due to cancer. This is a significant figure and, if true, should be publicized by NIOSH.)

Even if it were possible to estimate the occupational morbidity in Hawaii by extrapolating from national figures, one would still want to know what the actual rate is in this state as compared to the rest of the nation, as well as what specific occupations here present the greatest health hazard and how many people in these jobs become ill. Only then could efforts to alleviate occupational disease be focused appropriately.

As suggested earlier, the official source of occupational disease statistics, Workers' Compensation, tells us almost nothing about the actual incidence of workers' illnesses, because it relies exclusively on reports from workers.

Workers' Compensation is a share-the-risk insurance program run by the State of Hawaii's Department of Labor and Industrial Relations (but operated privately in some other states) in which employers pay a monthly premium to ensure that workers can be compensated for lost workday and medical costs due to work-related injuries and diseases. Originally set up to compensate workers for accidents on the job, the insurance program has proven inadequately flexible to deal with occupational diseases where cause and effect are so much more controversial. Thus, occupational disease claims in some states run as low as one percent of injury claims (Ashford 1976:416) even though occupational diseases are more prevalent than occupational accidents and probably result in more deaths. (Compare the National Safety Council's estimate that 14,000 people die each year of accidents on the job with the NIOSH estimate of 100,000 annual deaths due to occupational disease.)

In Hawaii in 1976 only 5.6 percent of all Workers' Compensation claims were for disease. But this is up from earlier years.

1976 ... 5.6%
1975 ... 4.5%
1974 ... 3.8%
1973 ... 4.4%
1972 ... 4.6%
1971 ... 4.1%
1970 ... 3.6%

(See the DLIR publication, Workers Compensation in Hawaii for the years 1970-1976)

No more recent statistics are available because in 1977 the Department of Labor decided not to differentiate between accidents and illnesses in their annual reports. Perhaps as a sop to worker interests, the Department at the same time initiated the publishing of a breakdown of accidents and diseases by occupation. So beginning with 1977 figures we do have an official record showing which occupations are the most hazardous, but we have no way of knowing, because of the manner the Department has chosen to record them, whether workers in these hazardous jobs suffer more from accidents or from diseases.

Several factors constrain workers from reporting occupational illnesses. One is ignorance. Many occupational toxins produce vague symptoms like sleeplessness, irritability, bouts of nausea, headache, or upper respiratory tract virus-like illnesses. Other illnesses, such as cancer, have latency periods as long as twenty or thirty years and workers have retired or moved on to other less-toxic jobs before symptoms appear. In either case, most workers have no information which would lead them to associate their illnesses with their jobs so they do not report them as occupational diseases.

In most cases, workers' lack of education about occupational diseases is not made up for by physicians' competence. The average physician is woefully uneducated about occupational medicine. Medical schools teach about diseases via studies of internal organs and organ systems. Thus doctors tend to conceive of illnesses as the result of abnormal physiological functioning. Some schools of medicine point out a connection between the environment and illnesses, but in special seminars or extracurricular courses. "The average medical student," say Stellman and Daum, "spends as much time studying tropical diseases such as malaria as she or he does learning about occupational medicine" (Stellman and Daum 1973:5). At the University of Hawaii medical school, according to the physician who gives these special lectures, students devote only a couple of afternoons--maybe four to six hours--to occupational medicine.

A second factor constraining workers from reporting occupational disease to Workers' Compensation is fear. The worker who reports that his job makes him ill runs the risk of being fired, especially if he or she suffers from repeated bouts of illness. In addition, if the employer does not agree with the worker about the cuase of illness, the worker faces a possible legal battle with Workers' Compensation.

Complicating all of this is the knowledge, shared by both workers and their doctors (and of course by employers also) that it is difficult to know for sure that a particular illness results from occupational toxins. Fran's symptoms, for example, are consistent with any number of diseases. It is easier on the worker to rely on his or her sick leave and medical insurance if necessary (and possible) instead of raising

medically complex and politically sensitive questions about disease causality.

For all of these reasons, then, Workers' Compensation statistics show very few occupational diseases. Their figures are also useless for pinpointing hazardous jobs because the Department of Labor and Industrial Relations compiles statistics according to industry, not according to occupation. So a major cateogry--manufacturing, for example--includes truck drivers, maintenance people, secretaries, assembly line workers and top management. From this we can extrapolate nothing about toxins on the job.

Besides Workers' Compensation records, the Department of Labor and Industrial Relations also publishes an annual Occupational Injuries and Illnesses Survey, this one put together from employers' reports. Employers, not surprisingly, under-report occupational disease even more than employees do. Nationwide, it is estimated that only 2 percent of all occupational disease show up on employers' records (compared with 3 percent on records generated by employees) (Ashford 1976:11).

In Hawaii, employers' accounts would indicate that occupational diseases are only a tiny fraction of occupational injury. In 1976 employers reported that 2.7 percent of all accidents and disease were disease, in 1975 they reported 2.9 percent diseases, in 1974 and in 1973 it was 2.6 percent.

Beyond these two reports--one generated from employers' reports and one from employees', the Department of Labor publishes no other figures which would help them or anyone else to determine what jobs in Hawaii are hazardous to health or how many workers get sick.

One might expect that the Department of Health would have some statistics on occupational disease. And indeed it does have an on-going statewide Health Surveillance Program in which a sample of the population is asked what illnesses it has experienced during the previous twelve months. In 1974-76 data were collected from 40,193 residents and it not only included specific diseases but the occupation of respondents as well.

The information, however, is not particularly useful. In the first place, there are too few people in each occupation category to be able to draw reliable inferences. Even a combination of all eight years during which the survey has been made (1969-1977) and which picks out the occupational categories with the largest number of people (twenty-one categories) turns up a very small number of diseases. Chief of the Health Surveillance Program, Paul Kawaguchi, says there might be a higher-than-expected amount of high blood pressure, sinus trouble and stomach ulcers in these groups, but he can't be sure.* In all eight years there were only twelve cancers. A second problem with the Health Surveillance information is that it only records current jobs. Retired people are simply listed as retired and there is no way of identifying people who previously worked in an industry known to be highly hazardous. In short, the Health Surveillance Program, designed to cross-tabulate disease with age, sex, race and by "usual activity" (i.e., working, keeping house, retired or going to school), contains no useful information linking disease to occupation.

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*Personal communication.

The state Health Department also supports a tumor registry to which hospitals report cases of malignant neoplasms. The demographic variables the registry designers consider significant are age, race and sex, so the registry reports contain nothing whatever about occupation. Will Rellahan, the registry's director, says they've "tried for years" to connect cancer to occupation but most cancer patients are retired and that's the occupation that shows up on hospital records. He pointed out that even if records do show current or most recent occupation they "can be very misleading because a person may have held an entirely different job twenty years ago when they contracted the cancer."*

The last possibility of finding specific information on occupational health hazards is the Cancer Center of Hawaii at the University of Hawaii which holds a grant from the National Cancer Institute called "Occupational Cancer Risk." A group at the Cancer Center is doing a cohort study from 1942 but, unfortunately, the project has just begun and it will be three years before they expect to have useful data.

The conclusion from all this is that no one in Hawaii knows what the most hazardous occupations are in this state nor who contracts occupational disease and, with the exception of the Cancer Center study, there are no plans to find that information. Indeed, with the Department of Labor's new statistical methods no public record of reported occupational disease will be kept at all. DOSH will continue to have access to reported occupational disease statistics but these records won't reflect the true incidence of occupational disease unless workers are both well enough educated and secure enough in their jobs to report them. Without statistics showing that occupational toxins actually make people sick,

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*Personal communication.

there will be no urgency about following OSHA regulations nor about promulgating new ones. But it puts the cart before the horse to expect to develop such statistics out of Workers' Compensation figures. They must come from studies which follow a group of workers who have been exposed to some suspected health hazard--such as the NCI-funded study mentioned above, or Selikoff's now-famous studies of asbestos workers (Brodeur 1974). What happens after that depends a good deal on other factors: the educational and enforcement activities of OSHA (and state agencies like DOSH), the strength and attitude of labor unions, the response of businesses to attempts at regulation and the degree to which ensuring a healthy workplace seems to conflict with other societal goals.

The following chapter examines the first three of these factors, and the next chapter explores the fourth.

CHAPTER IV

THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

In which we learn about the operation of a government agency based on a disease causality hypothesis which threatens a powerful group of people

DOSH: Inspections

Hawaii's Division of Occupational Safety and Health occupies a group of offices in the Gold Bond Building close to Honolulu Harbor. From his ninth floor corner office, Wayne Mount, DOSH's administrator has a spectacular view of the Pacific ocean, waves breaking gently along the shore. It's a work-a-day part of the coastline, though--no sunbathers, no surfers. If Mount wants to remind himself of what DOSH is all about he can look directly down from his windows at the used car lot, the fish market, the produce warehouses, the sewage pumping station and the tour bus yard between him and the blue water.

Down the hall from Mount, in two large rooms dotted with desks and bookshelves, one finds the compliance officers. The curtains are usually partway drawn across their view. Perhaps they don't feel the need to remind themselves what workers' lives are like; their job is to inspect Hawaii's workplaces for hazardous conditions.

From industry's point of view, these inspectors are the most visible DOSH activity. Despite the constant reiteration--from Eula Bingham, the head of the federal OSHA program, down to the director of the Hawaii program that workers' health is a more serious problem than workers' safety, in their day-to-day operations the occupational safety and health agencies

concentrate on safety. At DOSH there are fifteen safety inspectors and four health inspectors; of some 2,500 inspections per year, an average of 156 are for health--about 6 percent. (Extrapolated from DOSH quarterly reports to the Hawaii Department of Labor and Industrial Relations, 9/75 through 6/79).

A list of priorities, set down by federal OSHA, determines where inspections will be made. In the health branch fatalities and catastrophes have first priority, and complaints have second priority. In third place are referrals from the safety inspectors. These are cases in which a safety check has turned up some possible health hazard. Fourth priority is supposed to go to materials newly found to be toxic. From time to time DOSH receives information about such toxins from OSHA. But, says Masa Ogata, chief of DOSH's health branch, they usually handle these notices not by making inspections of places where they are used, but by publicizing them "through newspapers, notices to employers and that sort of thing." And, he's not sure, but, they "might have let some unions know."* Fifth priority goes to general schedule inspections in which industries and businesses are chosen for inspection on the basis of Workers' Compensation claims. This last category accounts for somewhere between a third and a half of the inspections, according to Ogata.

In other words, the health inspections are reactive, not initiatory. Ogata and his compliance officers wait until they have reports of someone becoming ill and then they inspect the place of business.

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*These and other remarks by Mr. Ogata and all the quotes from DOSH personnel in this chapter come from a series of informal interviews at DOSH headquarters in the spring of 1978 and again in the spring and summer of 1979.

When they do inspect, they seldom discover toxin levels above the OSHA standards. Standards are so lenient, says Ogata, "we don't find too many violations . . . It's a problem finding good places to go." ("You mean bad places?" I asked. "Yes, places where you are going to find toxins over the limit.")

NIOSH listed 12,000 toxic substances employed in workplaces in the U.S. (Ashford 1976:88) and OSHA has set standards for 382 of them (OSHA 1978:540-549). The majority of the standards were adopted when OSHA was founded from the standards the industry had already set for itself through the American Council of Government Industrial Hygienists (ACGIH) and the American National Standards Institute (ANSI), two private "consensus groups." These standards have been under increasing attack for their leniency by critics of OSHA, by employees of OSHA and NIOSH and by unions (Scott 1974; Herman 1978). Since 1971 OSHA has promulgated only twenty-two new standards of its own, fourteen of them at one time for a group of chemical carcinogens and one each for asbestos, vinyl chloride, arsenic, benzene,* coke ovens, cotton dust, DBCP, and acrylonitrile.

Any suspected toxic agents not specifically listed in OSHA (or DOSH) regulations fall into the General Duty clause of the law, requiring employers merely to provide their employees with a healthy workplace. Thus the great majority of toxins workers are exposed to are virtually unregulated.

For inspectors the laxness of the law is not their only problem. They also find it hard to know what toxins to look for when they enter

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*The benzene standard was thrown out by the Supreme Court in June 1980.

a workplace. A really top-notch health inspector would be so familiar with production methods that he or she could make reliable guesses about what any process might employ. HEW continually publishes books alerting readers to possible toxins. But there are so many toxins and so much to learn about them and the turnover in inspectors is high enough so that the ideal situation rarely occurs. Inspectors often rely on statements from employers about the toxins in use and often employers have no idea. An auto body shop, for example, uses paints, varnishes and stripping solutions containing a whole array of possible toxic chemicals. But usually the people there know only what is listed on the label and often the ingredients are brand names, not generic names. Often even the manufacturers are ignorant of what is in their products. One NIOSH official points out that workers are exposed to 86,000 trade name products representing 10,500 manufacturers. Many of these are secondary manufacturers who re-formulate and re-label products. "Small firms take a product and mix it up with something else and they put their own label on it and they really don't care what was in it to begin with. They will mix it with something and call it something else and charge what they want and we have a very complex situation in terms of resolving trade name products." The product the worker uses may be three or four generations away from the original chemicals (Sundin, 1978).

The inspections themselves are designed to be more sensitive to management's needs than to workers'. My persistent efforts to be included in an inspection were turned down by the administrator of the federal OSHA program in Hawaii, the administrator of DOSH and the head of DOSH's health branch. On every occasion I was told that I couldn't go because my presence would disconcert management. Whether there were

additional, unstated, reasons or not, clearly these agencies feel it a primary task to conciliate management. Because of this my information about health inspections comes from the descriptions of others.

Inspections, for which no advance notice is given unless an employer refuses to allow DOSH entry,* begin with a brief "opening conference" between compliance officer and employer. The walkaround itself includes a representative of the employees, as well as someone from management. Sometimes instead of taking one worker with him, the inspector merely talks with workers at various work sites as he goes along. He moves from place to place, collecting air samples, noting the use of protective equipment, checking the labels on cans and drums, looking for mandated warning signs and fingering dusts and powders. All the time he's making notations on his clipboard and calling the attention of the accompanying personnel to violations.

This walkaround marks the end of the worker's participation in the inspections, unless--according to a new regulation passed a year ago--he or she is "invited" to participate in the closing conference. The closing conference, casual as it may appear on the surface, determines

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*In May, 1978, the Supreme Court ruled that an employer can bar an OSHA inspector from his or her workplace if the inspector doesn't have a search warrant. According to Wayne Mount, administrator of DOSH, this ruling has had little effect on DOSH. Most employers continue to allow OSHA in for unannounced inspection. In perhaps eight or ten instances a year DOSH is barred, usually for ideological reasons. Weyerhouser and Continental Can, for example, make it a point to refuse unannounced inspections. In these cases, Mount says, DOSH just goes through the usual court procedures (which do not, says the Supreme Court, need to include probable cause) and makes the inspection later.

to a large extent what safety and health violations will actually appear on the formal notice and how much of an abatement period DOSH will allow. It is, in short, a time for negotiations and when the compliance officer has compiled a long list of violations, the negotiations can go on, in Ogata's phrase, "for quite a while."

Robert Stengle, the head of the Brewer Chemical Corporation told me during an interview that Brewer often can talk the inspector out of a citation altogether and Ogata says DOSH "regularly" gives "informal variances" to companies which seem to be "in compliance with the spirit of the law but not the letter." Ogata explained that the inspector tries hard to maintain a pleasant relationship with employers. "If [the employer] wants to talk story,* we let him. We want him in a receptive mood. We don't want him to get upset and file a claim or anything."

The actual abatement period and any fines or penalties are decided upon in the DOSH offices, officially by the administrator of DOSH, but actually by the compliance officer together with Ogata. Sometimes, for example, an informally agreed-upon abatement period of two weeks seems unreasonably long, back at the office, and in the formal notice the employer learns he has half that long to comply. In that case, however, the employer can ask for an "informal hearing" with Wayne Mount, DOSH's administrator, a hearing which is attended by the compliance officer, his supervisor and, again, if "invited," a representative of the employees.

In keeping with their policy of minimizing an adversary relationship with employers, when DOSH levies penalties, the penalties are light. The average fines (for health and safety violations together) between 1974 and 1976 ranged from $11.26 to $40.79 for "non-serious" violations, and from $44.00 to $90.00 for "serious" violations. (See

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*"Talk story" is pidgin for "chat."

the Semi-Annual Evaluations; Reports for the State of Hawaii DOSH by OSHA.) These fines are considerably lower than fines for the rest of the nation. Ashford reports that between July 1971 and June 1973 the average penalty for non-serious violations was $45.00 and for serious violations it was $625.00 (Ashford, 1976:260).

If the closing conference serves as a time to try to convince employers that DOSH is not really to be feared or mistrusted, it functions to give workers--who are there, if at all, by invitation only--a mixed message about DOSH's loyalties. No one who described these closing conferences to me--and I am reporting on information I received since the passage of the new rule inviting employees to attend--mentioned the possible or probable presence of workers at such negotiation sessions. So if they are there at all it must be, in most cases, as passive observers. What employer would invite a rabble-rouser? What employee would risk her job by arguing with her employer about fines and abatement periods? Workers' quiescence on fines is, in fact, demanded by law. Employers may contest abatement periods and proposed penalties. Workers may only contest abatement periods (see Hawaii Revised Statutes (HRS) Chapter 398 (Sec. 111).

It is important to realize that DOSH inspects the atmosphere in which men and women work, not the men and women themselves. The exception is for asbestos workers, who must receive periodic chest X-rays if they work in an environment with more than 0.1 asbestos fibers longer than 5 micrometers per cubic centimeter of air, and people who work in high noise levels. Other than that, the DOSH focus is not on people but on things. Inspectors are supposed to ask workers during the walkaround if

they've noticed any health hazards. Leaving aside the issue of whether such a question would be likely to elicit much information--especially with a manager right there--one notes the difference between that question and one inquiring after the worker's health. I once asked Masa Ogata what they do if a worker calls to ask how some substance affects his health. Masa said they refer the person to his or her own physician or to an industrial hygienist. I asked him if they might refer the person to the DOSH education branch. "Oh yes, we might do that. But if you want medical opinion you've got to pay for it."

The compliance officers are not, by any means, overworked. Each of the four health inspectors makes, on the average, slightly less than one inspection per week. (See Semiannual Evaluations; Report for the State and Hawaii DOSH by OSHA, 1975-1978.) With about 1,700 workplaces in Hawaii--not counting construction sites--it would take at that rate almost 100 years to go to each workplace once. But it is not DOSH's goal to visit all workplaces. Because of the paucity of stringent standards, few inspections are worthwhile from DOSH's point of view. The thousands of un-inspected workplaces, the even larger number of ignored workers, do not weigh heavily on the consciousnesses of DOSH personnel. Accepting a reactive approach to occupational disease prevention, Masa Ogata says he doesn't "feel the need" for any more employees in the health branch.

Ogata is a soft-spoken pleasant man with a twinkle in his eyes. He presents a more casual attitude toward occupational disease than he perhaps feels. The first time I talked with him he explained that his

job is limited: "We can only follow the rules." He is perfectly aware that employers clean up the worksite as much as possible for a DOSH inspection, that they shut down possibly hazardous operations when compliance officers come around, and that they try to steer inspectors to the least contaminated parts of the workplace. "We don't manage to make sneak inspections," he says. "We are too visible."

In his general attitude, Ogata doesn't seem to differ significantly from the profile of OSHA inspectors described by a trainee in Science for the People. In a 1975 study the author found that most inspectors work for OSHA for personal, not idealistic reasons; they consider themselves technocrats, just people doing a job within legal guidelines; they avoid working too hard, and feel an antagonism both to management (they trade horror stories about plant conditions) and to militant unions (Science for the People, pp. 17-18).

And certainly, OSHA's health branch is no place for reformers. Limited by a flaccid law and a policy which trades workers' health for management's good will, the only thing compliance officers can do is accept occupational diseases as a regrettable fact of life, amenable to little interference from government inspectors.

DOSH: Educators

Down the hallway from these compliance officers is another large room--this one without any windows at all--housing the DOSH education and information branch. According to Hawaii statutes this "department may disseminate through exhibitions, moving pictures, lectures, pamphlets, and any other method of publicity, information to employers, employees

and the general public regarding the causes and prevention of industrial accidents and injuries" (Hawaii Revised Statutes (HRS), Chap. 396, Sec. 4(c) 1). A review of DOSH's movies reveals that, as the law implies, safety is given more emphasis than health and, as a bias favoring management would suggest, the causes of industrial accidents and diseases are seen to be worker carelessness.

The notion that the blame for occupational injuries and illnesses rests with workers has a long history in American industry, stretching back at least to the foundation of the National Safety Council in 1912 (Berman 1978:77) and continues to be the centerpiece of all industry-sponsored health and safety education programs.

> In their effect on the labor force [says Berman] management safety doctrines constitute a form of ideological counter-insurgency which shifts the blame for accidents and diseases away from management. Instead of problems of industrial design and speedup, accidents become inevitable problems of a supposedly immutable human nature. The effect is to induce passivity about working conditions. It would make sense to blame workers for accidents if they controlled factory design and the organization of work, but those questions are considered to be management prerogatives. (p. 76; emphasis added)

By the same token it would make sense to blame workers for occupational diseases if they had full knowledge of the health effects of all the toxic substances they worked with and were provided with complete protective apparatus and clothing. Given the present lack of knowledge about occupational health hazards, even by scientists, let alone by workers, it is indefensible to "educate" workers to believe that the workplace is only dangerous for those men and women who are personally careless.

Of the 128 slide shows and movies in the DOSH 1978 audio-visual catalogue, 38 were supplied by the National Safety Council, an industry-oriented private agency notorious for its victim-blaming ideology (see

Berman, 1978:77-78); three were supplied by OSHA or NIOSH, one by a union (Oil Chemical and Atomic Workers' Union), seventeen by various private industries such as General Motors, John Deere, 3M and Xerox, and the rest by educational film companies.

Ten of the films are about occupational toxins; seven about noise and three about respirators. The remaining 108 are about accident prevention--ladders, tools, trenches, "office safety," roofing, and so on. Artistically, it's a grab-bag. Some are so dull the DOSH staff rarely uses them. Others are well edited, absorbing productions with good color, effective music and plenty of drama. Regardless of their quality, the themes of these movies are similar: human error is the cause of occupational death and disease.

In the five films I previewed, management was depicted as being fully informed about occupational toxins and doing everything in its power to guard workers' health. The message was soothing: the work-place is as safe as it can be. One film, about occupational carcinogens, narrated by John Wayne and with music by Mick Jagger, emphasizes cooperation and democracy. The viewer is told (not shown) that workers now have equal input with employers and government in making health and safety regulatory decisions. Another film about H2S intones "Trained men have no fear," implying that only lack of education causes H2S poisoning. One movie takes an historical theme: before the Industrial Revolution jobs were dangerous but now science has brought us enlighten-ment. It ends with a sequence showing white-coated scientists in laboratories, medical students in absorbing lectures, and imposing buildings labeled schools of public health: scientific progress is

making occupational disease a thing of the past. In an especially boring British film the narrator uses the passive voice throughout so the point of view is obscure. It depicts every worker fully protected with breathing apparatus and so on, but a series of accidents occurs, in each of which the worker has been clumsy or hasn't read warning signs and he gets a dose of a toxic gas or receives a burn.

Neither the movies nor (according to the education staff) other DOSH programs tell people how to recognize symptoms of any occupational disease. Clearly the education program tries to avoid alarming workers and exacerbating any mistrust workers may have of management. Janet, one of the educators, says that when she goes to a health and safety meeting called by a union "there is always someone there who's very belligerant. They want to show how management is all wrong," but her job, she feels, is to "try to move the discussion more on to the duties of the worker."

More often than anger, however, she encounters worker boredom. In sessions called by management, she remarks, "I get the impression they're just there because the boss told them; they aren't particularly interested in safety and health." Everyone is restless, she says. "They want the broad to shut up so they can go home."

Little wonder the workers are bored. The emphasis on personal responsibility makes the presentations patronizing: "we are telling you this for your own good." An irritated response follows almost automatically: "don't tell me what to do; I can take care of myself." Because only workers are shown to play a role in occupational health, the issue becomes trivial, something for goody-goodies. It fits into an

old series of insipid "Health-Ed" programs: in second grade we learn to carry our little chairs safely; in fourth grade they teach us to brush our teeth up and down instead of back and forth; in sixth grade we get the food-groups-and-healthy-diet talks; in high school it's driving rules and regulations. And now they tell us about respirators, safety goggles and obeying signs at work. The implication that there would be little malnutrition, few accidents and greatly reduced diseases or deaths if only people would take care of themselves, so conflicts with everyday experience that the lectures, films, pamphlets and posters are more insulting than informative. They invite derision.

It is not to be wondered at that DOSH educators enjoy as leisurely a work pace as do compliance officers. A glance at the big calendar on their office wall confirms OSHA's report that the four educators* together make only about fifteen education presentations per month (OSHA Semi-annual Evaluations of DOSH). Hawaii's workers are not exactly beating at DOSH's door to hear their version of health education.

In addition to these programs, called training classes, DOSH educators make some dozen or so mock inspections each month (called consultations) to help employers keep abreast of the changing regulations, for the health and safety rules are in a constant state of flux.

DOSH: Advisory Committee

These rules are the responsibility of the DOSH administrative branch. In order to watch the administrators at work we move back to the window

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*Currently there are four educators. Were all positions filled, there would be seven.

side of the building, to a conference room overlooking the Pacific, where from time to time a group of people known as the advisory committee meets to discuss proposals for new health and safety regulations.

The advisory committee, according to Ed Turner, the former DOSH administrator, consists of fifteen to sixteen men, an equal number from management, labor, and government. Committee members are appointed for two-year (staggered) terms. Turner told me the committee is a "liaison between industry and unions to OSHA," and said they "hash out" all new standards. "That's why," he explained, "so few testify at the hearings."

The current administrator, Wayne Mount, who talked with me in April 1979, a few months after moving up from assistant administrator to Turner's position, reiterated Turner's description of the advisory committee as a group representing labor, management and government, equally. The committee has what Mount feels is an "outstanding relationship" with DOSH administrators. "They are good, competent, well-informed people." "Of course," he cautioned, "they are only an advisory group."

The official list of advisory committee members in May 1979 contains fourteen names in four categories; two people are listed as representing service organizations, four from unions (with a blank for a fifth person), six from management and two from government. The service organization people are Richard Botti, the lobbyist from the Legislative Information Service of Hawaii (LISH) an interest group of small businesses, and Louis Downey, identified as a "Certified Safety Professional" with the First Insurance Company of Hawaii, but officially

representing "Veteran's Safety." Since neither of these men indicates in any way that he thinks he represents the interests of workers, it is safe to conclude that the advisory committee has eight representatives from management, four from unions and two from government.

I was allowed to attend a meeting of this advisory committee on May 8, 1979. On the agenda were proposed new standards for cotton dust, inorganic arsenic, lead, acrylonitrile, asbestos dust and noise, plus a number of deletions and additions in safety regulations and some changes in record keeping. The proposals, all told, covered 146 typewritten pages. Of the fourteen committee members, eight were in attendance that afternoon: one union representative, five management representatives (I include here the two from service agencies) and two from government. Wayne Mount, the administrator, Hal Barks, the assistant administrator, and I brought the number to eleven. Mount chaired the meeting but Barks, as recorder, took responsibility for moving it along. His upper lip was dotted with beads of sweat throughout the two and a half hours we sat around the table.

His agitation, however, cannot be explained in the context of what occurred during the meeting. There were no arguments, no raised voices, no challenges, no defenders, no voting. Nothing, in Turner's term, was "hashed out."

The lone union representative, Calvin Werner, said not a word beyond the few pleasantries he murmured as he took his seat. Of the management representatives, only Gene Plishke (Amfac, Inc.) gave evidence of having read the fat sheaf of proposed new standards, and only he and Richard Botti (LISH) took an enthusiastic part in discussions. Plischke even

wanted to go over the new federal regulations and, in fact, in something of a perfunctory manner, the proposals for lead, cotton dust, acrylonitrile and arsenic were discussed, none of them, though, beyond the first page.

It was the locally-generated proposals which received most of the attention and which, in the end, were effected by the opinions of these advisory board members (or to be specific, the management representatives on the advisory board).

Taking exception to proposals for hearing conservation which mandated (1) the testing of noise reduction programs by periodic comparison of sound levels with audiometric testing of workers and (2) the reduction of worker exposure by administrative means (i.e., rotating shifts, changing job patterns), the committee members complained that the rules made industry responsible for all hearing loss, no matter how it occurred. The complaint fell on fertile ground.

When the DOSH proposals were publicly released several weeks later, for the formal hearings, these proposed regulations had been changed to minimize industry's responsibility for reducing hearing loss. The first section (213.4(B6)* was modified to require the testing and comparison but to mandate referal of employees to otolaryngologists if they show hearing loss. The section dealing with administrative controls was deleted altogether. Thus because of industry opinion, the law contains no means to protect workers from hearing loss beyond the wearing of ear plugs or ear muffs. If his hearing threshold shifts a worker is merely sent to a doctor.

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*State of Hawaii Occupational Safety and Health Standards, Rules and Regulations.

The other portion of the new regulations receiving attention from the advisory committee was the asbestos proposal. Despite Barks' description of these standards as "mainly directives laid on us by the feds," advisory committee members turned immediately to those subsections which were of local origin, specifically a paragraph dealing with establishments doing brake and clutch jobs. The brake and clutch job proposal gave an exemption from the monitoring of employees' exposure to establishments (principally service stations) which do fewer than five such jobs a week. This paragraph, said Barks, was merely a way of extending to all establishments a variance which had been given only to service stations holding membership in LISH. But, said Botti, the variance had been made for LISH establishments doing two brake jobs per day. What was the rationale for reducing this number to five per week? Barks had no answer. "Our health branch recommended it," he said.

"But the health branch says service stations have no asbestos problem," complained Botti. "Why do they want to change the existing standard?"

Barks didn't reply. However the proposed exception was deleted from the final draft of the new standards as they appeared at the time of the public hearing. Also deleted from the final draft were other asbestos rules also suggested, I learned later from Ogata, by the DOSH health branch; rules which were not even discussed at the advisory committee meeting. One was a page which mandated engineering controls on asbestos (e.g., exhaust ventilation for buildings and for hand-operated and power-operated tools). The other was a page on personal protective equipment for asbestos workers.

Besides these new standards, members of the advisory committee discussed a proposal that variances may be granted if they are "the safest feasible solution after all the relevant factors have been considered" (Sec. 1049.2 State of Hawaii Occupational and Health Standards, Rules and Regulations). Of interest was the word "feasible." It was obvious from the tenor of the discussion that feasibility was an on-going issue in the advisory committee. "Feasible," they agreed, includes "economically feasible." The word doesn't only mean feasible through engineering means, or politically feasible. It refers also to the cost of health and safety to employers. Cost-benefit considerations, they felt confident, are a legitimate part of standards promulgation.

At the time they spoke, the new standard for benzene was in the courts (it is now before the Supreme Court Marshall v. American Petroleum Institute) over precisely this issue. OSHA contends it can promulgate standards without making a cost-benefit analysis. The oil industry disagrees. Neither the union representatives (in whose interest it presumably is to rule out cost-benefit considerations), nor the DOSH administrators, nor the federal OSHA representative brought this fact to the attention of the other members of the advisory committee.

There is no way of knowing for sure what occurred between the time of the advisory committee meeting and the draft of the new regulations that was publicly circulated six weeks later. But the fact that DOSH administrators do not regard the committee meetings as occasions where decisions are made was revealed by Hal Barks at the beginning of the meeting. Gene Plischke had plunged in eagerly, objecting to virtually every section Barks brought up, showing signs of readiness to go over

the proposals line by line. But Barks kept brushing away Plischke's suggestions. Several times he pointed out that this session was just for "talking generally" about "areas where there might be disagreement." Actual specifics, he said vaguely, could be taken care of later. When this "later" might be, who would be included in it, whether advisory committee members would be officially informed about it--none of these questions were raised. No one took exception to this interpretation of how new regulations are created.

DOSH: Public Hearing

A series of formal public hearings followed the advisory committee meetings, one each on Maui, Kauai, Hawaii and Oahu. Copies of the proposed rule changes--rewritten after the advisory committee meeting--were available at state offices on each island at the cost of 25 cents per page. At that price, 146 pages would cost $36.50. Ordinary people are not encouraged to take part in these "public" events.

At 10:00 a.m. on July 12 the director and deputy director of the Hawaii State Department of Labor, Wayne Mount, and a secretary sat down behind two huge polished tables in a conference room at the Department of Labor and Industrial Relations. In the several rows of chairs facing this formidable barrier of tables were half a dozen members of the public, including me. The atmosphere was hushed. On the wall above a tall bookcase someone had tacked up the Department of Labor's bumper sticker: Labor--with LOVE.

Following the Secretary of Labor's obligatory reading of the entire legal notice which had announced the meeting, Wayne Mount gave a short

speech in which he played down the importance of the public hearing. The new standards, he announced, were, for the most part, merely attempts to comply with mandated federal regulations. He then asked for testimony from the public.

The only testimony came from Sam Casalina who introduced himself as an "industrial hygienist and representative of my company and Alexander and Baldwin, Theo Davies, and Matson Navigation." Ignoring the suggestion that the new standards were all unavoidable federal regulations, Casalina informed the assembled group that the people he represents "go along with" the 0.1 standard for asbestos as a necessary "clarification" of the former regulation which required medical examinations whenever there was any exposure to asbestos. (This new standard, making the rules less stringent, had not been discussed at the advisory committee meeting.) He wanted everyone to know, however, that the California law only requires medical exams when there is one asbestos fiber per cubic milimeter of air. He also remarked that he questioned the new "log and summary" rules, a provision allowing employees and unions "access to information relating to occupational injuries and illnesses" kept by employers (see Sec. 103.7 (B) 1 and 2). Casalina said "we would just as soon not disclose our data; it just causes anxiety to workers." At this point another man identifying himself only as someone from Matson, spoke up to support Casalina.

Behind their big table, the government people nodded and smiled politely, noncommitally. After a few minutes they pronounced the meeting closed. The whole thing had taken less than half an hour. For another ten minutes or so everyone stood around in informal discussion.

I remarked to Mount and Casalina that very few people were in attendance and no one at all who seemed to represent workers. Heads nodded; somewhat unusual, they said. But, Casalina explained, it isn't necessary for many people to come to these hearings because the advisory committee is made up of representatives of all sectors, including unions, and the new regulations are the "result of compromise" following "thorough discussion by all sides."

Unions

In the weeks between the advisory committee meeting and the public hearing I talked on the telephone with the four union representatives on the advisory committee. They all expressed dissatisfaction with the committee, but for different reasons. Calvin Werner from the ILWU, the only union man who had attended the May meeting was the most annoyed. "They always lose my packet," he said. "So I come to the meeting without having read the stuff beforehand. First time I see it is when we sit down."

"Usually at meetings," he continued, "there's me and maybe two other union guys." Not realizing, perhaps that three union representatives would be three-quarters of the union members, he explained that there is "poor union response" because "there are too many company guys. If we take a vote the unions usually lose . . . The company already has the majority so we get voted down."

But he assured me that they do protest; their lobbyist protests at the public hearings. "We get them then. We made a difference with the asbestos thing . . ." Evidently Werner is not aware that health

and safety regulations are made neither in the advisory committee meetings nor at the public hearings, but someplace in between.

"Why do you keep going to the meetings if you're outnumbered?" I asked. "I don't know why I keep going. To give 'em hell, I guess."

Joseph Reff, the representative from the PECA-IBEW Electrical Industry thinks the committee has only symbolic power. "Whenever we met, if we want to change, they tell us it's all federal standards. I thought we would have a chance to change things . . . but we only eliminate a word here or change a little thing there." When I asked him about management's power to change anything he said he "wouldn't know" if they have more say than unions do about DOSH standards.

Howard Tasaka, Sheetmetal Workers (AFL-CIO) has no complaints about the structure of the advisory committee for unions are represented and standards seem to him to be a compromise among all groups. The problem he sees is in allocating time for the meetings. "We're busy people. . . . They drag these meetings out, going over and over each thing . . . Management has more people they can employ over this stuff; the unions are handicapped." But since Tasaka believes the standards are "pretty good," he has no fundamental quarrels with the committee.

His colleague Paul Hong from the United Public Workers agrees with him. Unions can have significant input into health and safety regulations, but the meetings are too time consuming; he's tired of the whole thing. "I tried to buy out a long time ago . . . We don't have staff resources. Sometimes the meetings take two or three afternoons and go on into the evening."

About 129,000 men and women in Hawaii belong to labor unions (Hawaii DPED 1979, p. 200) or nearly 40 percent of all workers. But almost half of all employed people are blue collar workers (see Figure 1) and since most unions organize blue collar workers, a higher percentage of these workers are members of unions. These, of course, are also the workers with the greatest exposure to occupational toxins.

Nevertheless, and as might be inferred from the remarks to me by the union men on DOSH's advisory committee, unions in Hawaii have not been in the forefront of the fight against occupational disease. Some, indeed, contribute heavily to the impression, fostered by DOSH's education branch, that safety is a greater problem than health and that, in any case, worker carelessness is the cause of accidents and disease. For example, take the health and safety course the electrical workers unions (PECA-IBEW) offers its members.

Held in the evening several times a year, the course subjects the handful of union members who have enough loyalty to the union to tolerate such things, to three hours of boredom, condescension and vagueness. They sit in one of the well-equipped union headquarters' classrooms and go over with the instructor--page by tedious page--a folder of union rules about safety. Although electrical workers are exposed to both suspected and confirmed carcinogens and to a whole list of other health hazards (see NIOSH 1977 and Stellman and Daum) the union materials call attention only to high voltage cables, fire protection, trenching, grounding, hard hats, driving rules, stairs, guard-rails and other elements of accident prevention. During the class I attended in August 1979, the instructor never once referred

directly to occupational disease nor did he suggest in any way that some responsibility devolves upon management for protecting workers from accidents or illnesses. The rules he did discuss were vague to the point of meaninglessness.

"You're going to get hurt if you tamper with the safeguards, so try not to . . . . The fire-extinguisher has to be checked frequently . . . You're supposed to get a face protector and ear plugs . . . If you're using gasses, better be sure you have the right protection . . ." (Who is supposed to check the fire-extinguisher, provide the face protection or ear plugs? What should a worker do if these things are not provided? How does one know if face protection is "right"?)

"Try not to leave tools around . . . You gotta have enough light to work by . . . There's a docimeter in the office if you want to check noise levels, you know, the noise pollution . . . Most of the time ear plugs are OK . . . You gotta get ear muffs if the noise is above so many decibels . . . You gotta have sufficient air in manholes . . ." (How do you know if there is sufficient air? What happens if there isn't? How are descibles measured? What happens if the level is too high? What should you do if you have ear plugs but think you ought to have ear muffs?)

Throughout the evening the faces of the nine students remained impassive. Even during the break they were closed, private. No camaraderie marked the meeting. No outsider could determine from the blank looks how the men regarded the course. Certainly they didn't hide fear or outrage. No man could have gone home with a sense that the workplace is full of newly created and untested chemicals and that a

controversy rages over the effect of these chemicals on the long-term health of workers.

Few other unions even have such a vehicle for informing their members about occupational disease, and most of them do not want to arouse the antagonism to management that information about health dangers courts. Leonard Sebresos, the staff man at the International Association of Heat and Frost Insulators and Asbestos Workers lectured me over lunch one day about the necessity of maintaining good relations with management. Personal relations assume greater importance to him than issues of health and safety. Analyzing the campaign of a well-know young radical for the post of United Public Workers president, he said, "John's straight and honest . . . He makes too much a distinction between right and wrong. He's too blunt. See, he doesn't think of the consequences; he hurts the pride of management. You need a certain diplomacy as part of the business world and when you're negotiating contracts . . . You don't always lose if you make decisions that don't seem to be in favor of unions . . . Unions are like the engine that makes everything go."

Later, he drove me to Queen's Hospital where, in the basement, two high-spirited union members were recovering the asbestos coating on overhead pipes with a non-asbestos insulating material. The ceiling was low and hospital personnel had for years been inadvertently nicking away at the asbestos whenever they swung brooms or large pieces of equipment upward. Using no protective equipment whatsoever, the two workers entertained themselves while we were there by jauntily flicking chunks of asbestos from the pipes and watching my reaction as the white

powder floated slowly to the cement floor. "We're all full of this stuff by now," chortled one. "I've been working with it for fifteen years. Might as well just wait till the cancer gets us." Sebresos grinned. And the gap between the sober pamphlets in his office, the painstaking laws, and the everyday lives of asbestos workers opened before me.

I recalled an earlier conversation, some months before, between us. People who work with asbestos, Sebresos had said, "declare themselves fit and healthy. They're afraid of finding out if they have asbestos [sic]. They won't face reality. They won't go to a doctor . . ." The law is regularly violated, he said. For example, "A plumber is supposed to cut up some old pipes covered with asbestos, and if he says to his foreman he doesn't want to do a dangerous job like that, the guy asks, 'Do you want to work today or do you want to go home?'"

Sebresos does not attempt to reconcile these remarks about fear and coercion with his belief that a union leader should put the maintenance of pleasant relations with management above the immediate needs of workers. If "unions are like the engine that makes everything go" it is acceptable for union members to risk their health for the larger purpose of the machine.

The perception that unions and management enjoy a harmony of interests, so prevalent in current American thought, was given a boost in the Spring of 1979 when the ILWU testified in favor of the C. Brewer Corporation in a health and safety court case. The previous August, Brewer had been cited by the federal Mine Safety and Health Review Commission for the noise levels in a gravel quarry it owned near Hilo.

"It was just an in-house operation," C. Brewer's Director of Safety explained to me. "We were just using the gravel on our own roads." So Brewer refused to reduce the noise level (presumably they felt that the workers subjected to the noise were their own workers, also). When the federal inspectors returned in November and found no changes in noise levels, they ordered the quarry closed. Brewer took the case to court (Hilo Coast Processing Co. v. Sec. of Labor, Federal Mine Safety, Health Review Commission). At the hearing some months later, the ILWU testified in the company's favor saying that jobs were on the line. The judge, commenting on the fact that the union testified in favor of the company, held in favor of Brewer.*

The ILWU does not always take management's position on issues. One of the more prominent ILWU spokespeople in Hawaii, Ah Quon McElrath, sees unions and management in a struggle over health and safety issues. In a July telephone interview she told me that workers are uninformed about occupational disease, fearful of being fired or laid off if they make an issue of health and safety, largely unorganized, and victimized by weak laws which result in ridiculously low fines for safety violations and flimsly workers' compensation regulations.

Other unions lack supporters of any kind for health and safety. The office of Teamster president Art Rutledge referred me to the head of

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*Tom Takemoto, head of the Hilo Coast Processing Company's industrial relations department, characterized this issue during a telephone interview in the same manner as the safety director had. "It's our own rock crushing operation," he said, "strictly for building and maintenance on our own roads and facilities." He said about twelve employees did the actual rock-crushing and would have been directly affected were the quarry closed, and another 15-18 who haul the rocks would have been indirectly affected.

their health and welfare department when I called them about occupational diseases. A woman in that office suggested I call the hotels where the Teamsters work if I wanted to know about occupational hazards. I said I wanted union information, not management. Well then, I should talk with a business agent. The business agent I finally got hold of informed me that they don't see many occupational diseases. "We don't have an asbestos problem that I know of. That's the big one. We did have one case of allergy; I don't know if that counts . . . We also had one heart attack . . ."

Clearly the Teamsters, Hawaii's third largest union with 5,999 members in 1973 (Hawaii DPED 1979, p. 187) is not exactly tuned in to occupational health problems.

On the other hand, Van Horne Diamond, until recently the head of the AFL-CIO, Hawaii's largest union, has taken some leadership in the issue. He speaks publicly from time to time about occupational diseases and was the recipient, with two other people, of a $50,000 OSHA planning grant in 1978-79 aimed at worker education. Diamond's position, as expressed during a panel discussion for a University of Hawaii medical school class, is that "people need to think differently about occupational hazards. We have the laws it's a matter now of attitude change."

The most conservative industry spokesman could not have put it better. There are some 90,000 members of the AFL-CIO in Hawaii, a union which includes asbestos workers, carpenters, textile workers, construction workers, glaziers and glass workers, plumbers, roofers, sheetmetal workers, plasterers and cement masons. All of these men and women are exposed everyday at work to toxic substances, some of them carcinogens

whose long-term effects on their health scientists only barely understand, and their chief spokesperson in the state complacently claims that the presence of these occupational hazards raises neither political, economic nor social questions.

The labor unions then--either because of a victim-blaming outlook like Diamond's, an apparent ignorance, or at least avoidance like the Teamsters, or a lack of resources as expressed by some ILWU members--do not present a significant challenge to industry over health and safety issues. Thus industry people can lobby against rules that protect workers' health and safety without fearing much interference from unions.

Management

And they do. In the case of noise standards proposed by DOSH to the advisory committee, C. Brewer lobbied hard--and won--to get them removed. The Brewer Chemical Company Director of Safety, Mike Roman, a member of the DOSH advisory committee, told me in an interview that industry representative on the committee "have lots of input. We were very instrumental in the ROP regulations [Roll-Over Protection in tractor cabs]. We don't have the money to do engineering controls . . . and often we don't have the manpower to do administrative controls." So someone at Brewer talked DOSH into removing the proposed rules which would have mandated administrative controls to reduce workers' exposure to high noise levels. "We do safety apparel," he told me--in this case ear protection--instead of reducing the noise itself or removing workers from it. Roman was obviously proud of Brewer's

ability to influence DOSH. He showed me the pages in the state law of weakened ROP regulations for which they had lobbied.

Roman also explained to me that DOSH fines are low because if they get too high "someone will eventually go to the Governor who will tell DOSH to lay off." He remarked that you can only do this on the state level. People whose businesses come under the jurisdiction of federal OSHA have no such leverage. "You can go to [U.S. Senator] Dan Inouye, but he's no help."

The Legislative Information Service of Hawaii (LISH) also feels it has power over DOSH. It takes credit for a DOSH variance which exempts 70 percent of the service stations in Hawaii from monitoring their employees' exposure to asbestos fibers. The variance was given not to particular service stations that had demonstrated extraordinarily cautious brake job techniques, or excellent education programs or an absence of brake jobs altogether. The variance was given purely on the basis of membership in LISH. Anyone who has purchased a membership receives a variance. Although the variance states explicitly that it is only for LISH stations doing fewer than two brake jobs per day, LISH office personnel are unaware of any such restrictions. The only requirement, a woman there told me on the phone, is to follow DOSH regulations: wear respirators, change filters, and take "other environmental precautions."

Richard Botti, the LISH man on the advisory committee, feels he has an important voice in the making of health and safety rules. "The make-up of the committee is excellent. I'm proud to sit on it. It's not a big shibai* like a lot of things. It's one of the things that I do that's really important."

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*Shibai is Japanese for "show," "stagey," "fake."

In addition to their efforts to influence state health and safety regulations, the larger Hawaii industries employ industrial hygienists and safety directors whose job it is to keep the companies from being cited and fined by DOSH compliance officers.

One of these, Rolly Frost, a former DOSH educator who works now for Pacific Resources talked at length with me about his job. Like other company safety men, Frost finds himself in the middle between management personnel who want to put minimum resources into health and safety, and workers, in whose interest he knows it is to have stringent regulations. "The only backing I've got is OSHA," he told me. "I love those guys . . . Without [OSHA] I would really have a hell of a time conning management here. You can't prove occupational illness to them. You can just do safety . . . So you need a prod . . . What we really need is the unions--train the stewards. They need to demand more health practices."

One afternoon, Frost took me with him to inspect a company oil refinery in Campbell Industrial Park. He spent an hour or so walking around the work areas, noting probable DOSH violations. At one point he picked up some gaskets lying around a small shed, examined them and then noticed three or four workers sitting at a nearby table. Stopping awkwardly a few feet from the table, clearly ill at ease, Frost blurted out, "There seems to be some asbestos in these. So you guys make sure when you grind you're downwind so you don't breathe any of the dust that comes off it, eh?" The workers nodded vaguely and Frost moved away. This, presumably, was worker education. A few minutes later Frost told me he wasn't actually sure whether the gaskets contained asbestos, but some other gaskets he'd tested did.

While we were there a delivery truck drove up loaded with rolls of white insulating material. Frost strolled over to the driver and asked if the material contained asbestos. Oh no, assured the driver, all asbestos-free stuff. Frost cut a small chunk from one spongy sheet. "I'll get the lab to analyze it," he said to me. "This guy doesn't know what he's got. He's just repeating what he's told."

Clearly, Frost himself is told nothing. As the company's safety man he is not in a position to decide what insulating materials will be employed at the plant, nor does management tell him what is being ordered and used. The safety man's job is to keep the comapny from being fined, not to protect workers from health and safety hazards.

At C. Brewer, Roy Ishikawa the chemist in charge of monitoring health hazards on the plantations sees his position more clearly. "Basically," he says, "the whole idea behind monitoring is to keep the company from losing money in workers' comp."

Talking with me in the Brewer lab, surrounded by chemical glass-ware, Ishikawa said that the only way he knows what chemicals to monitor for is to ask the plantation managers. But he has to use a lot of diplomacy because some managers don't want him around, taking air samples, looking for trouble. His presence on the plantations is only on the sufferance of management. "I need their cooperation." So he tries to "stay out of the politics of the things . . . I don't want to get involved in making changes. They might not let me come again . . . I have no power."

Mike Roman, wearing his hat as Brewer Safety Director instead of his member-of-the-advisory-committee hat, also told me "I have no real

authority. I'm a staff man." When I asked him about chemical hazards to workers he admitted that he doesn't know what chemicals workers are exposed to on the job. When he makes an inspection--all the big companies hold their own inspections; they don't wait until DOSH comes around--he reads the label on any chemicals he sees in use to make sure the worker is complying with the label instructions. To my question about the pesticide DBCP, a potent carcinogen in heavy use on pineapple fields here, he said he doesn't think anyone uses DBPC anymore, but he's not sure.

The lack of authority and information these industry health and safety people exhibit belies the power their superiors possess over government health and safety regulations. As we have seen, that power is not maintained through an evident struggle with unions, workers, or government regulators. The power, manifested ultimately in the unabated exposure of workers to potent health hazards, derives from an ideology shared by owners and managers of industry, their health and safety officers, union officials, workers and government regulators. That ideology forms the subject of the next chapter.

CHAPTER V

IDEOLOGY AND DISEASE CAUSALITY

In which we learn that the environmental theory can be subverted by an ideology which places science above values

The preceding chapters are based on the principle that the way we conceptualize the causes of disease determines who we call responsible for its prevention. I have argued that to be effective disease prevention programs must be rooted in an environmental concept of disease causality. Beliefs about disease causality which locate disease in the individual instead of in the environment make disease control an individual responsibility and they result in an unequal distribution of health, dependent upon social class.

My theme is that in the current debate over the causes of cardiovascular disease and cancer, the environmental hypothesis is in danger of being discarded, not because it lacks any more scientific validity than the other contending hypotheses, but because it threatens industrial production. I discussed how in the nineteenth century a similar debate was settled, also in the absence of scientific agreement, in favor of that theory which least interfered with industrial production and I argued that OSHA, despite the fact that it was founded on the basis of an environmental hypothesis, confounds that hypothesis in its day-to-day operation and serves the interests of industrialists more than those of workers.

In other words, the disease causality question cannot be separated from political issues. Moreover it should not be separated from politics. Attempts to settle the debate a-politically condone policies which distribute health and disease unequally. The mechanism for doing this, I submit, is to conceive of society as an organic entity. In this final chapter I discuss cost-benefit analysis as an example of this mechanism, including the utilitarian attitudes from which it springs, the reification that it demands, and the characterization of American society that it embodies and the belief in science that feeds it.

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"They're pumping out regulations without any logic," says Robert Stengle, the president of Hawaii's Brewer Chemical Company.* "We have inspectors in here continuously from various agencies . . . The cost of safety has already been horrendous." He gestures toward a pile of file folders on his desk. "OSHA has caused the inflation rate to go up two percent."

Or maybe OSHA is responsible for only one percent of the inflation rate; other people make that claim (Fleming 1978). The point is that any disease prevention program based on the environmental hypothesis of disease causality distributes public health costs in new ways. By calling on industry to shoulder responsibility for disease control for first time the environmental hypothesis raises fundamental political questions about equality and justice.

U.S. Senator Daniel Inouye says that federal regulations cost American businesses $102.7 billion in 1978 (Honolulu Advertiser 2/7/79). The price of the average new car is said to include $600 in federally

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*I interviewed Mr. Stengle in his office on June 20, 1979.

mandated health and safety features; other regulations may add almost $10,000 to the cost of a new home (Rattner 1979). Fifty cents of each pharmaceutical prescription and 25 percent of hospital costs may be due to regulations (Weidenbaum 1978). Dow Chemical has estimated its regulatory compliance costs at $186 million per year and in a 1977 report Dupont said it would spend $3 billion over the next decade for air, water and noise pollution abatement required by federal regulations (Fleming 1978). The Manufacturing Chemists Association estimates that compliance with the Toxic Substances Control Act might cost industry as much as $1.3 billion (Carter 1979:248) and the American Industrial Hygiene Council says that OSHA's new generic classification of carcinogens will cost industry up to $88 million (Dickson 1979).

Whether these figures are accurate or not is anybody's guess. Proponents of the environmental theory of disease causality accuse industry spokespeople of wildly overestimating the costs of regulations. In some instances these proponents have been able to show that the amount an industry estimated it would have to pay to comply with a proposed new regulation considerably exceeded what it actually paid once the regulation went into effect (Epstein 1978:305; Green 1979:5). They also assert that some estimates of the costs of regulations lump together the costs of the older "economic" regulatory agencies like the FCC and the CAB which serve large industries by reducing competition, and the new very different "social" regulatory agencies like the EPA and OSHA which reduce industry's freedom to pollute the environment and expose their employees to toxic substances (Ashford 1978; Kelman 1979).

Charging that an emphasis on the costs of regulation tells only half the story, proponents of the environmental hypothesis of disease causality point to the benefits of regulation. For example, a Nader

study compared an estimated $4.3 billion cost of OSHA with an estimated $7.5 billion saving from reduced illnesses, accident and deaths (Green 1979a); OSHA director Eula Bingham testified in a Senate Appropriations Committee hearing that OSHA regulations, because they reduce death and injuries, also reduce medical care costs (U.S. Congress, Senate Hearings, 1979); and in a New York Times article, Nicholas Ashford wrote that estimates of cost must take into account the "billions of dollars of economic savings that result from regulations--from lower worker compensation insurance premiums, fewer nuisance and negligence lawsuits and a more productive workforce" (Ashford 1978).

But regardless of how much they actually cost and regardless of their actual benefits, the point is that new government regulations attempt to transfer a large portion of the responsibility for chronic disease prevention from the individual to industry. Such a transfer has not occurred before because the notion that industrial pollutants cause disease has only recently gained currency. For the last 150 years responsibility for controlling the major (infectious) diseases (whether believed to be caused by miasmas or germs) was laid on governments and throughout the world, state agencies--some enjoying far better funding than others--have administered public sanitation projects to that end. The costs of these projects are distributed more or less equally among all taxpayers.

Now a new theory about disease causality prompts a new distribution of disease prevention costs. Until recently industries have been able to pollute the air, water and soil, to expose workers to untested gasses, fumes and dusts, and to market virtually any products they chose, without having these acts linked to disease and therefore without having either

to pay the costs of the resulting ill health or to invest money in disease control. But mounting scientific evidence that chronic diseases result from industrial practices has forced industry spokespeople to modify their notions of responsibility.

"I wish to emphasize that neither I nor industry in general object to all regulation nor do we argue that reasonable regulation is not needed or justified," says Richard Fleming the executive vice president of Air Products and Chemicals, Inc. (Fleming 1978:17), emphasis in original). His statement is typical of industrialists, even when they address their professional peers. However, since a truly effective regulatory program would mean a radical change in the way health costs are apportioned, industrialists resist accepting real responsibility for disease control in every way they can. A tiny bit of regulation might be all right, but industrialists want to ward off what Fleming calls the "epidemic [of] government regulation running well beyond reasonable or sensible bounds" (p. 16).

In the face of the "epidemic" not just industrialists but some legislators, scientists, journalists and ordinary citizens have in recent years challenged government agencies to justify health and safety rules. They do not question that industrial production causes disease; they object to the shift in the burden of risk inherent in government regulations. Without health and safety regulations the general public risks getting sick and industry continues its present production methods. With regulations the burden is reversed: the general public is presumably protected against the risk of disease but the owners of industry risk losing profits. Before they will accept that risk, industrialists say, they want some justification. They demand that a risk-benefit analysis

(or a cost benefit analysis) to determine whether the benefits will exceed the costs be made prior to the promulgation of new health and safety rules.

They present a seductive argument in favor of such an analysis. Envisioning the government as a single organism beseiged by competing claims, they offer cost-benefit analysis to it as a method for making value-free decisions. Competing claims would be settled on objective, economic ground, instead of on the old subjective criteria in response to political pressures. Using a cost benefit analysis, the government would total up the costs and benefits of proposed regulations and implement the program which promised the most benefits and least costs to everyone concerned. The whole undertaking would be a step toward greater democracy (Hapgood 1979).

But it wouldn't. Instead it justifies the extant unequal distribution of wealth and power and invites poor people to sacrifice their health to the pocketbooks of the wealthy. And, significantly, it implies that the environmental hypothesis of disease causality is inapplicable, thus undermining an environmental approach to the prevention of cardiovascular disease and cancer.

* * * * *

Cost benefit analysis is based on the belief, so central to modern cultures, that the scientific method can be used to make social policy. It rests on the assumption that we can learn truth if we put away passions and bias, and that social ferment, uncertainty and conflict are mere mechanical "problems" that can be resolved through careful engineering. Champions of this machine-like concept of society try to separate disputed values from politics, assigning them to an insular private sphere

and to create a public arena governed by dispassionate technology and devoid of divisive moral premises. They want to treat the whole of society, in all its contradictions and indetermination as though it were a purposeful business enterprise devoted to a single uncontested end.

In certain cases a comparison with a business enterprise may fit socities--in time of war, perhaps, as Bertrand Russell notes (Russell 1962:217) or immediately following a successful social revolution--but late twentieth century America is not one of the cases and attempts to treat it like a business only highlight its complexity and turmoil.

As an example, let us consider the case of cost-benefit analysis and benzene. As noted in Chapter I, benzene is a petroleum derivative used as an octane booster in gasoline and in the manufacture of such products as tires, nylon, pesticides, adhesives, laminates, paints and ink. When OSHA was established it adopted the ACGIH standard of ten parts per million for benzene, but as evidence accumulated that it causes aplastic anemia, leukemia, chromosome damage and lymphomas, OSHA promulgated a new standard (which went into effect on February 2, 1978) limiting worker exposure to one part per million. The American Petrochemical Institute promptly filed suit, arguing that the standard was promulgated without sufficient evidence to show that the benefits of lowered worker exposure outweigh the costs.

How could OSHA weight the benefits and costs of the new benzene standard? The benefits seemingly all accrue to workers and the costs to employers. From the point of view of industry the costs far exceed the benefits, even if one calculates the benefits of possible lower Workers' Compensation rates and less worker turnover and abseentism. (Chronic

benzene poisoning causes headaches, dizziness, fatigue, loss of appetite, irritability and nervousness [Stellman and Daum 1973:190].) In exchange for such miniscule financial gains, employers would have to provide benzene workers with respirators, impermeable clothing, semi-annual medical examinations and new training programs. In some cases they would have to reorganize the work process to create isolated areas to contain unavoidably high benzene levels (OSHA 1978). Clearly industry's cost-benefit analysis, crisp and unambiguous, would argue against a more stringent benzene standard.

A cost-benefit analysis from the point of view of workers would be vaguer, for neither their costs nor benefits is easily quantified. Having to use uncomfortable respirators and special clothing pose the major cost to workers. The benefits would be a lessened chance of a life-threatening disease with its concomitant reduced chance of medical bills, lost work days and all the economic and non-economic costs attendant upon illness and death. Presumably an informed worker would choose to wear a respirator for part of her working day rather than die young. So from the workers' point of view, the new benzene standard should be adopted.

Of course OSHA would not make <u>two</u> cost-benefit analyses, one from workers' viewpoint, the other from management's. It should hover somewhere above the workplace and analyze the costs and benefits to both groups together. But how? These groups are incommensurable. There is no way to offset the costs to industry with the benefits to workers. "If the hazard is great enough, you know," said OSHA director Eula Bingham, "if there are going to be 1,000 workers die of cancer as a result of not regulating, how do you weigh that against the cost of regulations?"

(U.S. Congress, Senate Hearings 1979:491). A cost-benefit analysis is meaningless unless those who pay the costs also reap the benefits.

For this reason some people advocate that the government calculate the costs and benefits of proposed regulations to the society at large. It should make a social cost-benefit analysis, they say, taking into account the widest effects of production, not only those directly related to the industrial plant itself, but also those seemingly external to production: social, economic and environmental.

However, important as it is to appraise as many factors as possible when making decisions, to quantify all factors, as a cost-benefit analysis demands, is impossible. Or rather, it is possible to assign monetary values to anything one has a mind to, but the values are either arbitrary and capricious or revelatory of a mean-spirited mind incapable of appreciating the mystery and richness of human existence. And a number of critics have pointed this out. William E. Burrows says that

> cost benefit tries to equate what is economically, let alone morally, unequatable; kilowatt-hours of electricity produced a nuclear power plant versus the number of cancer deaths caused by a slow radiation leak at the site where spent fuel is stored, for example. This kind of equation makes no sense unless we can decide how many kilowatt-hours of electricity a human life is worth . . .
>
> . . . Exactly how much of a given substance does it take to cause a human cell to turn cancerous? If no one knows, then every person who believes that there is some magic formula that constitutes a boundary between safety and death is seriously misguided. (Burrows 1979:84)

In a letter to the Senate Committee on Appropriations, OSHA director Eula Bingham said that

> no reliable means exist for assessing the costs of compliance. Moreover, determining whether the costs of a regulation equal the benefits at the margin cannot be done given existing methodologies and data. For example present accounting

> procedures do not readily permit the identification of expenditures for regulation apart from those for capitalization, operation and maintenance. It is also difficult to anticipate, prior to the promulgation of a regulation, its effects on technological and industrial innovation . . .
>
> Likewise it is difficult to quantify or to express accurately in monetary terms all the benefits of regulation. Failure to reduce workplace hazards results in enormous costs in terms of workers' compensation, disability, medical expenses and health insurance, lost productivity and worker turnover, but it is not feasible at this time to make a reasonable association between types of accidents or illnesses and subsequent costs. Moreover some benefits such as decreased pain and suffering, and a better community and family life, can never be quantified . . .
>
> . . . We do not believe that workers should be viewed as "human capital." They are human beings with non-quantifiable values, personal needs and feelings. Their health should not be determined by the outcome of a mathematical equation. (U.S. Congress, Senate Hearings 1979:519-520)

A further methodological problem is explained by Bingham's deputy:

> Although the costs of regulation may be more easily identified and quantified than the benefits, the estimated cost of compliance with an OSHA standard is still highly speculative. As noted earlier, traditional analysis of compliance costs assumes that the technology needed to comply with a standard is static. This ignores industry's capacity to learn and innovate, thereby reducing the cost of meeting regulatory requirements based on current technology. (Whiting 1979)

But there is more to the problem than methodology. Even if it were possible to quantify everything accurately, social cost-benefit analysis would still suffer from the same limitations as a narrower analysis. It would still ignore the unequal distribution of costs and benefits. It would still substitute a hypothetical, even distribution for the actual, discriminatory one. Some people--for example the men and women who inhale the benzene or the asbestos at work, or the people who live near the nuclear plant--pay high costs for industrial production with few benefits

while other people--for example the stockholders of the chemical company or the owners of their banks--receive hefty benefits with low costs.

A social cost-benefit analysis presumes a classless society where no one is spared the costs of industrial production and all share equally in its benefits. Only in that case could industrial costs logically be weighed against their benefits. To continue to insist on a social cost-benefit analysis in the face of its purely hypothetical character is to take part in the fiction that this is an economic democracy.

In the absence of a classless society, i.e., in a society composed of citizens with conflicting needs, unequal resources and unequal claims to legitimacy, the dilemma created when a cost benefit analysis reveals costs to one group and benefits to another can only be resolved by weighting the claims of one group more heavily than those of another. In other words, in the U.S., a social cost-benefit analysis is meaningless and cannot logically guide decision-making unless values come into play. The interests of some people have to be given priority over the interests of others.

But if values come into play, who should be the arbitor of these values? The government? In a democracy, the government can legitimately assign values only if the people who comprise it stand above the political fray and have no values of their own--only if, in other words, the government is neutral. To call the U.S. government neutral is to forget that presidents and members of Congress overwhelmingly come from the professional class (Miliband 1969). It is to forget that elected officials are beholden to those who finance their campaigns and that

these financiers are, for the most part, wealthy individuals (Green 1972). It is to forget that the heads of bureaucracies they appoint hold office only as long as they carry out their duties in a manner acceptable to those who appointed them. It is to forget that bureaucracies are collections of individual people with biases, assumptions and preferences which affect their perceptions of the world, allowing them to filter out sensory data they believe to be unimportant and to emphasize other phenomena they consider significant. And it is to forget that these biases, assumptions and preferences are unavoidably and heavily influenced by the values of the cultures' wealthiest groups (Katznelson and Kesselman 1975:355-401). Clearly, the American government like the government in any complex society, represents the interests of some citizens more than it does others. So the values selected in government bureaucracies to weight social cost-benefit analysis are the values of the dominant group. As Frances Stewart puts it:

> Social cost-benefit analysis . . . is highly misleading, and sometimes dangerously so, since it dresses up one set of activities--those of taking the objectives of one section of society, normally those represented by government, and showing how they may be more efficiently fulfilled--as another, that of maximizing the benefits to society. The former being a meaningful (and possible), but for many an undesirable, objective; the latter being meaningless and therefore impossible, though desirable. (Stewart 1979:304)

It should not surprise us that the chorus of support for social cost-benefit analysis includes spokespeople for industry like Richard Fleming of the American Industrial Health Council, John Healy of Monsanto and Robert Roland of the Manufacturing Chemical Association, along with conservative social scientists like Murry Weidenbaum. These men advocate cost-benefit analysis precisely because they expect it to

curb health and safety regulations (Fleming 1978; Wiedenbaum 1979; Carter 1979). They expect, not unrealistically, that people who work for a government dedicated to preserving the status quo will, if forced to make a cost-benefit analysis, respond to conflicting scientific reports about environmentally caused disease by opting for that policy which least interferes with industrial production. Citizens should continue to take health risks, they will conclude; industries should not have to accept new financial risks. This is called opting for caution.

It could also be called opting for blind patriotism. "The once rambunctious American spirit of innovation and adventureousness is today being paralyzed by a desire to build a risk-free society," thunders Henry Fairlie. "[But such a] society has always been a sign of decadence. It has meant that a nation has given up, that it has ceased to aspire to greatness, and has retired from history to pet itself." Comparing America today to the decline of the Roman Empire, and reminding us of the "brilliant inventiveness" of America's past generations, Fairlie warns that a "society whose governors invite people to inspect the list of ingredients on a package of dried parsley, as if this were in some way a contribution to the endeavor of the human spirit, is a society that will quickly sap the energy of its people . . ." (Fairlie 1979).

As a number of writers have observed (Ringen 1979; Lee 1977), cost-benefit analysis has its roots in the utilitarianism of the early nineteenth century. Utilitarianism stood in sharp contrast to the notion that actions are inherently right or wrong. Such a belief was too closely associated with the authoritarianism of the feudal era. In its place a

group of philosophers, with Jeremy Bentham as their leader and the Mills prominantly among them, offered the idea that social policy should be determined according to its usefulness.

Underlying the concept of utility was a belief that human beings are motivated solely by the desire to avoid pain and to seek pleasure. From that principle it followed that the proper role of government was to maximize the pleasure of the majority of the citizenry. The greatest good (pleasure) for the greatest number was the utilitarian goal.

> Nature has placed mankind under the governance of two sovereign masters, pain and pleasure. . . . They govern us in all we do, in all we say, in all we think: every effort we can make to throw off our subjection, will serve but to demonstrate and confirm it. . . . The principle of utility recognises this subjection, and assumes it for the foundation of that system, the object of which is to rear the fabric of felicity by the hands of reason and of law. . . . By the principle of utility is meant that principle which approves or disapproves of every action whatsoever, according to the tendency which it appears to have to augment or diminish the happiness of the party whose interest is in question: . . . I say of every action whatsoever; and therefore not only of every action of a private individual, but of every measure of government. . . .
>
> An action then may be said to be conformable to the principle of utility, or, for shortness sake, to utility, . . . when the tendency it has to augment the happiness of the community is greater than any it has to diminish it. (Bentham 1973:66-68, emphasis in original)

It was an entirely pragmatic method of decision-making and it flowed from a narrow conception of human motivation. As D. J. Manning puts it, the doctrine of utility "treats men as isolated units . . . bound by ties of interest rather than by ties of sympathy, mutual confidence, kinship and common faith" (Manning 1968:5-6). But of course it arose during an era when those ties had been broken with the destruction of feudal society. The new society instead of focusing on people and their

relation to one another and to God, focused on things. Men became important for what they produced, not for what they were.*

With production as the basis for value it was not inconsistent to try to quantify people's contribution to society and to select public policies according to a rational calculation of their costs. For the utilitarians were, above all, reformers. They intended to eliminate poverty and reduce disease. As we have seen, Edwin Chadwick, a fervent disciple of Jeremy Bentham, pressed for the nineteenth century sanitary reforms strictly on the utilitarian principle that to remove garbage and provide clean water would save money and make the work force more productive. The Sanitary Report is a frank appeal to the economic interests of the industrialist class.

Today utilitarianism, though infrequently called by name, has moved into the offices of government decision makers and is beginning to take up a comfortable residence. It still challenges the ancient position--the concept at the heart of Christianity--that men and women can look to eternal, immutable moral values to guide their behavior. Claiming that decisions based on morals are fundamentally biased, it offers itself as a neutral, value-free, democratic alternative.

Besides the fact that it is nothing of the sort, it is important to note that a major fault of utilitarianism is that it leaves no room for minorities. Once a government policy has presumably attained the greatest good for the greatest number, there is no rationale for extending benefits to the smaller number left over. The extreme pragmatism of utilitarian

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*Women, however, at least well-to-do women, were to a large extent left to enjoy and to suffer from their old feudal role.

thinking admits no moral arguments. Numbers--rational and clear--serve as the basis of decisions, not appeals to sentiment. You clean up the slums just to the degree necessary to prevent disease and only for that purpose. You reduce toxins in the workplace only until the majority of workers are protected. The people left over, those embodiments of the number too small to count, have no claim on health protection because a policy based on utility can only focus on the welfare of the society as a whole, not on any particular member of it.

Today we see utilitarian attitudes facilitate the confusion of a business-type analysis which limits costs and benefits to the workplace with a government-type analysis which tries to calculate costs and benefits to the society at large. With one foot in each type of analysis one can act as though the question were "To what extent can we endanger the health of the economy in order to protect the health of the individual?"

This question, by implying that "the economy" exists in the same way that people do, stacks the deck against people. It reifies the millions of individual financial transactions that comprise the economy, representing them as something more than the sum of their parts: some thing with a life of its own. Moreover, the metaphor anthropomorphizes these transactions, suggesting that since "the economy" can be healthy, it can also be sick and so needs to be tended, fed and supported in various ways by people.

We lose sight of the clashing, struggling interests that comprise the economy and easily think of it instead as one great organic being to whose welfare all its components are subservient. Such a reification

obscures the fact that some people are heads of corporations and others are coalminers. These differences dissolve into the grand interlocking network of relations and we can think of the economy as though it supports a homogenous society, or if not homogenous, at least harmonious, organic and justly arranged. No actual people need to be considered.

For example, consider the heading which appeared in a full-page advertisement for a book called Restoring the American Dream by Robert J. Ringer: "Man can survive pollution: environmentalists can relax about that. The question is whether he can survive regulation" (quoted in Dickson 1979:168). The people who have already died from exposure to asbestos have not survived. Neither have the hundreds who show up as the "excess mortality rate" attributable to industrial exhausts in New Jersey. Similarly, the families at Love Canal, the New York community built on the site of 21,000 tons of chemical wastes, don't care whether "man" can survive pollution; they care whether they can.

"Some well-meaning scientists," says a Senior Circuit Judge in a thoughtful article about neutral thinking, "question the wisdom of leaving risk regulation to the scientifically untutored. They wonder, to themselves if not aloud, whether the public should be permitted to make decisions for society when it cannot understand the complex scientific questions that underlie the decisions" (Bazelon 1979:278). Such scientists (I'll employ the judge's straw man, too) are talking nonsense. How could "the public" be different from "society"? Who could comprise "society" if not "the public"? These reifications permit people to make outrageous statements incapable of refutation because the statements do not refer to any thing.

"Man," "society," "the economy"--these words all take the third person singular. We can't say "man . . . they," or "society . . . we." These aren't aggregate nouns like "people"; they call up singular things. I am not arguing that we should avoid abstractions; they are indispensable for analytic thought. Mine is not the completely reductionist position that would analyze human beings without reference to a social context. I have made clear, I hope, the political consequences of viewing individuals as though they existed outside society. I am arguing that one should try (admittedly it is difficult) to avoid reifications which obscure who, exactly, one is talking about. "Society" doesn't do or think anything. People do. Likewise, "industry" and "science" and "the economy" are all abstractions, incapable of action.

I persist in this vein because to take these abstractions for real things makes one vulnerable to those whose interest is served by reification. Reified abstractions, says Murray Edelman

> encourage men to focus their attention and their passions upon the remote and symbolic and to move away from personal regard for quality and for creative work. They thereby magnify the possibility of manipulating people through manipulation of the symbols that engage them. (Edelman 1977:117)

A focus on the "remote and symbolic" inspires community-minded people to sacrifice their own health for the health of "the economy." A worker, for example, might decide it is in the best interests of the economy not to press for more stringent occupational health and safety regulations. This reification keeps her from realizing that the benefits of her sacrifice are not distributed equally among all people--a result which might give that sacrifice moral sanction--but instead accrue mainly to those who already enjoy wealth. Vicente Navarro notes that

> both Labour and Conservative governments in the United Kingdom and Democratic and Republican administrations in the United States have indicated that their primary role and concern is the "health" of the economy, with everything else being conditional on its survival and improvement. To have social services or to expand their benefits depends on having a "healthy" economy. The assumption that is made in all those cases, of course, is that the welfare of the people depends, first and foremost, on the welfare of the economy. But what is meant by the economy is the capitalist economy in which the capitalist class rules. (Navarro 1976:196-197)

A weak health and safety regulation promulgated instead of a strong one because it benefits "the economy," manifest the benefit in the bank accounts of the owners of industry, not in the bank accounts of industry's workers. So "the economy" is often a code word for the financial interests of the wealthy. This is not to say that there is no trickle-down effect. The network of relations that constitute the economy includes the poor as well as the rich, and to serve the financial interests of the rich can also mean to serve, willy nilly, the interests of the poor. But the rich come first and the poor get what is left over. That is why they are poor.

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To those familiar with the philosophical distinction between "reductionism" and "holism" (see Brodbeck 1968:239-335) it may appear that, in criticizing this use of abstraction I embrace the reductionist position, so closely linked to positivism, that only things that can be apprehended empirically "really exist." The assumption that mine is a plea for old-fashioned empiricism would seem to follow from my rejection of the holistic notion that, to use Durkheim's words, there are "social facts" with an "independent existence outside . . .

individual consciousnesses, which they dominate" (Durkheim 1968:254). I do reject a phenomenological viewpoint; I reject it for its moral relativism and its social determinism. But I do not, as I hope I have made clear throughout this text, substitute for it a purely empirical reductionist science. In fact, the criticism I am making of social cost-benefit analysis is precisely that it embraces both of these limited concepts. A social cost benefit analysis "does" reductionism in demanding a quantification of what is unquantifiable, and at the same time it "does" holism in assigning supra-human characteristics to society.

In the holism vs. reductionism debate I champion the formulation of reductionism Watkins calls "methodological individualism." According to this principle, says Watkins,

> the ultimate constituents of the social world are individual people who act more or less appropriately in the light of their dispositions and understanding of the situation. Every complex social situation, institution, or event is the result of a particular configuration of individuals, their dispositions, situations, beliefs and physical resources and environment. (Watkins 1968:270-271)

The significance of this view becomes clear when it is applied to social change. Methodological individualism, continues Watkins,

> by imputing unwanted social phenomena to individuals' responses to their situation, in the light of their dispositions and beliefs, suggests that we may be able to make the phenomena disappear, not by recruiting good men to fill the posts hitherto occupied by bad men, nor by trying to destroy men's socially unfortunate dispositions while fostering their socially beneficial dispositions, but simply by altering the situations they confront. (Watkins 1968:276)

Watkins is a bit glib. Except on a mundane and personal level there is seldom anything "simple" about altering the situations individuals confront. But essentially he's right. The point is that

unless we conceive of society as something created by and composed of actual people--not by "forces" or "ideas"--we feel powerless to change it. By the same token it is difficult to conceive of preventing disease if disease seems to adhere to social structure or natural phenomena that exist outside the human sphere. But if "the environment" refers to the things humans do, then, to paraphrase Watkins:

> The environmental hypothesis of disease, by imputing illnesses to individuals' social situation, suggests that we may be able to control disease not mainly by recruiting good antibodies to fill the posts hitherto occupied by bad germs, nor mainly by trying to change people's unhealthy behavior while fostering their healthful actions, but primarily by altering the situations they confront.

* * * * *

To downplay the role of individual men and women in the creation and maintenance of society is to encourage decision-making by those whom the radicals label "elites," the Marxists refer to as the "ruling class" and the mainstream press calls the "eastern establishment." It is to buy into the liberal idea that American society is not in any sense a "system" but the state of affairs that naturally results when men and women are free to develop their human nature and to pursue their interests. And finally it is to accept the presence of the diseases caused by this "natural" society and call them unpreventable.

Let us consider first the concept of unpreventable diseases. Is there an irreducible incidence of disease that is simply part of the human condition and therefore something that we just have to accept? Rene Dubos seems to think so (Dubos 1979). Or is it possible that "sooner or later . . . we will learn to cope effectively with most [diseases], maybe all."

Lewis Thomas argues this view (Thomas 1979:49). If there is no way to eradicate all disease, which particular diseases are not amenable to preventive techniques? How high an incidence of these diseases must we accept as normal? And what, indeed, are we to label "disease"?

In the mid-nineteenth century, the great German pathologist Rudolf Virchow divided diseases into "natural" and "artificial" categories. He decided that dysentery, malaria and pneumonia were among the "natural" diseases and that scurvy, typhus, TB and mental diseases were "artificial." By artificial he meant due primarily to social conditions (Ackerknecht 1933). A few years later in New York a group of physicians made a distinction between "preventable" and "inevitable" diseases, "the latter not to exceed 17 deaths annually" per 1,000 people (Citizens Association of New York 1970:xi).

Today the overall mortality rate in the United States is down to about 9 per 1,000, but the distinction between natural or inevitable diseases, and artificial or preventable diseases still has enormous consequences for public health policy. Some people have argued that cardiovascular diseases are merely the inevitable consequences of aging, not strictly diseases at all. Physicians can care for heart disease, stroke and arterial sclerosis but they cannot prevent them, any more than they can prevent grey hair. These are natural events resulting from biology. To give physicians their due, there is a fair amount of controversy about this. Although cancer and cardiovascular disease, writes Blumenthal,

> are commonly called "degenerative diseases," because of the evident relation to age . . . it is necessary to determine

> to what extent the principal causes of death from organic disease, which presently limit man's life expectancy are an accident deriving from exposure to some injurious environmental factor coupled with a loss of resistance due to impaired homeostatic function, and to what extent they represent an inherent part of the aging process. (Blumenthal 1962:viii-ix)

The much-publicized discoveries by medical anthropologists of societies in which many people live to a ripe old age and few suffer from cardiovascular diseases makes the natural-result-of-aging argument hard to sustain, but a more subtle explanation has taken its place. Cardiovascular diseases may not be biologically inevitable but they are culturally inevitable and cannot be prevented in modern societies. From here it is a short step to suggest that cancer too is the inevitable consequence of life in the industrial world and is, therefore, essentially unpreventable.

Whether the diseases which result from cultural practices are called "natural" or "artificial" depends on whether the culture itself is "natural." Indeed, in a "natural" society, "natural diseases" may be misnamed. Ordinary medicine, says John Powels, "hesitates to call progressive health-compromising processes--such as arterial degeneration, rising blood pressure and tendency towards diabetes--'diseases' because they are associated with a way to life it feels bound to accept as 'normal'" (Powels 1973:14). Running like a leitmotiv through the objections to the environmental hypothesis of disease causality is the theme that American society cannot be changed. It can be shored up here and there, its branches trimmed, new sections added on, but its base is rooted in human nature and major changes would require people to

behave in artificial ways. The resulting institutions could only be coercive.

Gary Wills (whose use of the past tense here can be attributed to style, not to a conviction that Americans no longer believe in the natural-ness of their society) describes this belief.

> Our system--not our ideology (we thought we did not have one); not our philosophy (we were "open" to the free market of ideas, not exponents of any one view); not our "-ism" (not even Americanism, for our system should be everybody's, not confinable to any one nation--any more than communism could be thought of as nationalistic). Communism--the basic stuff, however bottled in Russia or China or the "captive nations" --was countered, we thought, by nothing more rigid than freedom. It was just because communism was a philosophy, an ideology, that it led to slavery. We, by lacking much intellectual bondage, were the examples of freedom to all men, and its vindicators before them (or upon them).
>
> This all seems so obvious to most Americans, they still cannot bring themselves to believe that the rest of the world does not arrange reality around these very same poles. Only the brainwashing of slave governments could make people reject our system. (Wills 1977:16-17, emphasis in original)

Philosophers labeling it liberalism like to trace this belief back to Hobbes' conviction that people are naturally selfish and competitive and to Adam Smith's proposal that if individuals are free to pursue their own interests social good will result. They connect it to John Locke's principle that people are endowed with natural rights and to Newton's conception of nature as a predictable, harmonious and balanced machine and (as I have done) to Bentham's notion that societies should try to make the majority happy. But as John Dewey points out, all the brilliant thinkers "might have been as voices crying in the wilderness if what they taught had not coincided with the interests of a class that was constantly rising in prestige and power" (Dewey 1963:12-13).

Today it is unnecessary to refer to Adam Smith to justify the "natural-ness" of American society, or to Hobbes to argue that people are basically self-seeking. These assumptions are buried in social discourse and thus for most people never become problematical; they are inherent in our institutions, our language, our customs and our art, and they are inherent in our approach to disease prevention. When the Surgeon General blandly tells poor people that they can prevent disease by living like the middle class, when DOSH advisory board members agree that their job is to make disease prevention regulations that are "economically feasible," when Henry Fairlie in a hyperbolic outburst equates patriotism with illness, when a union official remarks that it is more important to get along with management than to prevent occupational diseases, when Masa Ogata says that workers needing medical advice cannot turn to DOSH, when both physicians and the general public agree that a disease causality theory isn't reasonable if it means disease prevention interferes with production--when people do these things, they affirm and perpetuate the liberal creed.

* * * * *

One final word is in order here. I have, throughout this paper, been inveighing against the transformation of science from a tool to an article of faith. I have pled for a more careful distinction between what is amenable to counting and measuring and prediction and what transcends the coldly rational and falls, not to science but to the unwieldy, rich and vibrant world of human beings. I follow in footsteps at least as old as science itself, for science has always carried both

the promise of freedom from superstitution, hunger and disease, and the threat of subjection to coldly logical, inhumane machines.

Science's threat results from the singular unit of analysis it conceptualizes. In order to count and measure, a scientist either must break down complexity into parts which are themselves meaningless but which, it is assumed, can be aggregated into a representation of the whole, or she can analyze it by threating the whole as though it were an indivisible entity, whose parts are only functions of that whole. In either case, science has reduced reality, not only in the sense of making it smaller, but in the sense of robbing it of something vital. This reduction, however, would not matter were the concpetions that flowed from it neutral, or value free. Alas, they are not. Bertrand Russell put it this way in 1931:

> The new ethic which is gradually growing in connexion with scientific technique will have its eye upon society rather than upon the individual. It will have little use for the superstitution of guilt and punishment, but will be prepared to make individuals suffer for the public good without inventing reasons purporting to show that they deserve to suffer. In this sense it will be ruthless, and according to traditional ideas immoral, but the change will have come about naturally through the habit of viewing society as a whole rather than as a collection of individuals. We view a human body as a whole, and if, for example, it is necessary to amputate a limb, we do not consider it necessary to prove first that the limb is wicked. We consider the good of the whole body a quite sufficient argument. Similarly the man who thinks of society as a whole will sacrifice a member of society for the good of the whole, without much consideration for that individual's welfare. (Russell 1962:234-235)

But even if science condones the sacrifice of the individual to the whole, and even if that whole is not a democratic, classless society, how else can decisions be made? If we don't depend entirely on science are we not left with bias and emotion, with prejudice and passion as a basis for decisions? Yes, we probably are. But since that is

precisely where science also puts us it is better to deny science its pretense of impartiality and to return political decision to the realm of politics. Disease prevention techniques will continue to benefit the rich more than the poor until we do.

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