

SCIENCE FOR THE PEOPLE

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CANCER

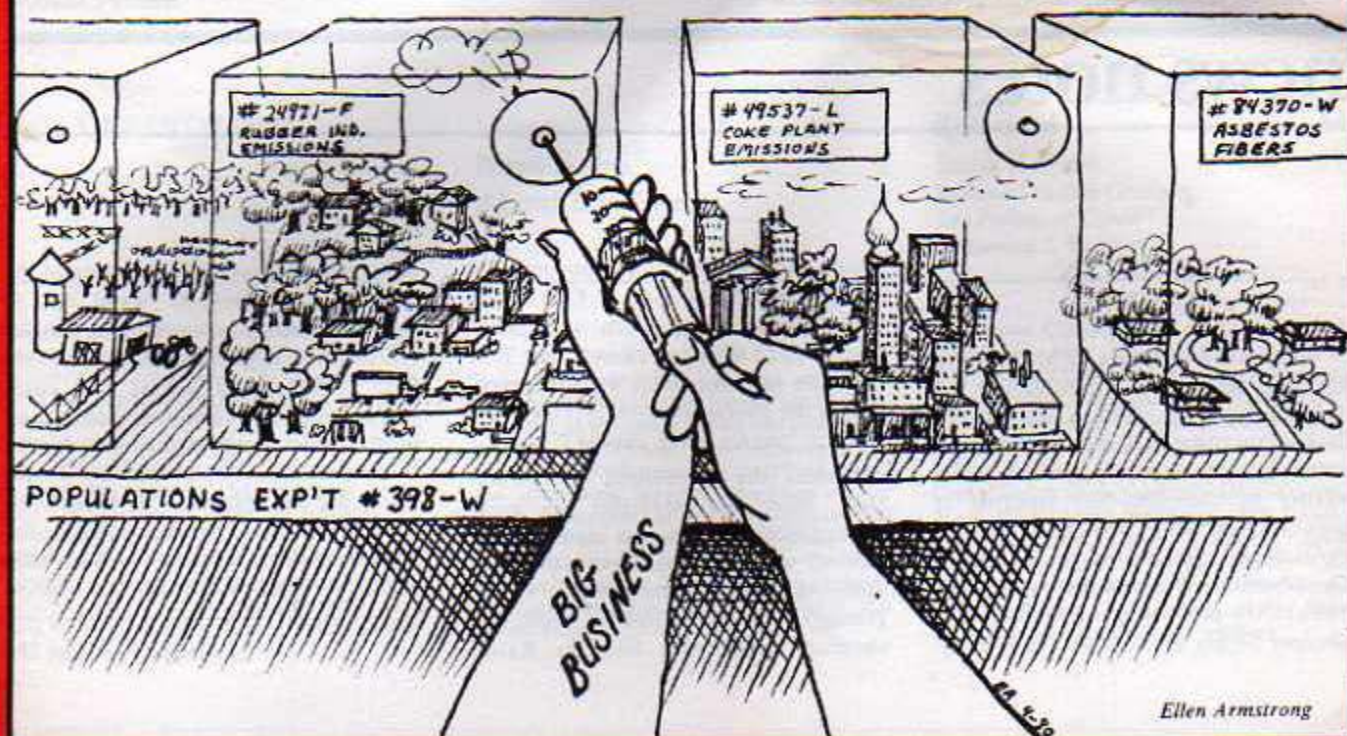
Notes for Activists

Coke Oven Cancer

Politics of Research

Why No Prevention

~ THE GREAT CANCER EXPERIMENT ~



letters

Dear StP,

I am writing this letter in reaction to your news note on "Investigating Menstrual Cramps" (Nov./Dec. 1979). I welcome biochemical research into prostaglandins, and certainly the recognition of painful symptoms around menstruation as "real" is long overdue. But I want to make several points here that your article discussed only partially or didn't mention at all.

Even if birth control pills relieve cramps by reducing the uterine lining where high levels of prostaglandins can occur, the source of the symptoms is not reached at all. Neither is it known whether continuous sloughing of endometrial cells or other side effects of the pill won't ultimately be a worse solution than enduring the cramps. The pill was long used to "regulate" women's cycles, cycles that did not fall into the "normal" 28 day routine. Now it seems that by suppressing and thus "regulating" ovulation, women coming off birth control pills can wait up to 2 years for a period to reappear. Prescribing a sometimes hazardous and poorly researched drug (not a historically unusual practice in Western obstetrics and gynecology) for an only just revealed biochemical oc-

currence deserves to be more strongly denounced.

Your article goes on to almost advertise new drugs, and minimalizes their side effects and contraindications. In one study, ibuprofen and acetaminophen equally relieved symptoms in 60 patients (and only relieved 50 percent of symptoms at that). Mefenamic acid "may be effective in controlling dysmenorrhea associated with the presence of the IUD" (masking warning symptoms of an equally not understood device?). Naproxen-sodium is not yet available in North America, yet it will be hailed as yet another panacea for "female troubles" (as soon as the drug company can push it through the FDA). (See *Medical Letter*, Oct. 5, 1979) It is interesting to note that the side effects of indomethacin include abdominal cramps, headaches, nausea, and dizziness. In several texts, its restricted use includes only gouty arthritis and moderate to severe rheumatoid arthritis. (See *Current Therapy* 1979, *Facts & Comparisons* 1979) Gastrointestinal bleeding can occur with a history of previous ulcers. (See chapter on iatrogenic medicine in *Medical Nemesis* by Ivan Illich)

There are many "alternative" treatments worth trying for menstrual discomforts. These include both preventative measures and symptomatic therapy such as: regular exercise (including relaxation and breathing techniques, yoga postures, running and swimming) and good diet (avoiding caffeine, alcohol, refined sugar, and salt; and supplementing with iron, calcium, magnesium, vitamin D, and potassium). Herbal teas can be helpful, such as ginger, red raspberry and crampbark, and others. Some women find orgasm effective in relieving symptoms. Also massage and acupuncture. (See *Menstruation and Remedies for Painful Periods*, a booklet by Blackwell Women's Health Resources Center, 203 W. Holly, Bellingham, Washington 98225)

Certainly some preventative efforts and remedies work for some women and not for all, but it is still important that these be offered as solutions and the women given the opportunity to try them. They may prove even more effective than hormones, diuretics, and pain-killers, and are most definitely safer!

Certainly the sophisticated new research information on prostaglandins, and the long-time knowledge and use of herbs and vitamins can both contribute to our understanding more about our bodies and finding better ways we can stay healthy.

Rebecca Fox
Member, Vancouver Women's
Health Collective

news notes

MICHIGAN MADNESS

Widespread dumping in Michigan of chemical waste rich in carcinogens has recently come to light. Long lists of leaky dump sites (120 dumps, 1400 polluted areas) have been published, and a variety of chemicals are reported in groundwater. The new chief of the enforcement division of the Michigan Department of Natural Resources said, "It's to the point where we may find it cheaper simply to write off the ground-

water supplies for large portions of southern Michigan. Chemical contamination may be so widespread that we can't afford to clean it up." This extensive contamination was characterized in the *Detroit Free Press* (Dec. 1-15, 1979) as "the tip of the iceberg."

Besides the generalized contamination, there are examples of acute contamination. "Disease and animal freaks" are rampant in the town of Hemlock. Mutant trout came out of the Hersey River near Cadillac. PBB and chemical waste runs into the Raisin

River near Adrian. 268 sites around the state have undrinkable water due to chemical contamination. CURENE 442, recently found to be a carcinogen, escapes from a factory in Adrian and coats everything. The citizens hold their breath, so to speak, as they wait for the first cases of cancer. In Bethany Township, 300,000 pounds of radioactive waste is thought to be responsible for the "extremely high incidence of lymphatic cancer — especially Hodgkin's Disease

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about this issue

You may very well die of cancer. One out of every four Americans now does. The medical establishment, with all its technology, money, and skilled researchers, is not going to find us a cure for this one. In fact, we can expect the proportion of deaths from cancer to rise, unless the public becomes educated as to the true causes of the disease and understands what must be done to stop it. The huge majority of cancers are not caused by germs that will respond to wonder-drugs but rather by particular social relations. It is these social relations which must be changed before we can solve the cancer problem. Massive investment in searches for conventional medical solutions are doing nothing more than creating a smoke-screen. What modern medicine refuses to acknowledge is costing us our lives.

The latest scheme for curing cancer to be triumphantly announced is the use of interferon—the body's own natural defense against viruses. Mass production of this chemical by genetically-engineered microbes (a technology with potentially disastrous social and environmental consequences) has been proposed to cure cancers "naturally." Quite aside from the fundamental question of whether interferon will indeed cure cancer, the treatment raises the same old issues that plague all plans to use a "magic bullet" as the front line of defense: Do we seriously plan to administer extra-normal doses of interferon to the one-fourth of the population that ultimately gets cancer? What would be the social costs of such a scheme and what would be the "side effects" of such an experiment? Can we sanction continued exposure of the population to carcinogenic chemicals, aiming our cures at the disease but not the cause? What of the other effects of carcinogenic chemicals? They often can cause birth defects and permanent genetic damage. Shall we find a cure for these too?

No. Cancer must as much as possible be prevented. Preventing cancer will not be easy. Its causes are numerous, and its biochemistry poorly understood. But beginning cancer prevention on a national scale need not await a full understanding of cancer biochemistry. Cancer can be seen as a social disease because many of its causes are the products of social decisions. This view leads directly to ways of controlling the disease, while the strictly biochemical view does not.

Synthetic chemicals and industrial pollution are the products of an economic system. Cigarettes and the lavish advertising and social stress that encourage smoking them are all products of that same system. Further, the victims of cancer have had little say in the decisions that lead to pollution, synthetics, asbestos, cigarettes, and hazardous workplaces. The big corporations somberly proclaim that life is not without risks, that "modern society" extracts a price. But who decides how this "modern society" is run? The risks, benefits, and decision-making power in our society are not divided equally amongst all of its citizens.

In his article, David Kriebel addresses political activists. In the face of increasingly sophisticated opposition from the medical-industrial complex, we will have to refine our analysis of cancer. We must move forward from simplistic formulations — for example, that synthetic chemicals are bad and natural ones are good. Also, while it is true that much cancer is caused in the workplace, we must not forget that the arm of industry extends even into our homes. Action must be taken on both fronts.

Public planners and statisticians make pseudo-objective evaluations of just how much good or harm certain practices do to society. Barry Commoner exposes the "science" of risk-benefit analysis. Who takes the risks and who gets the benefits? What's the result of comparing incomparables?

The workplace is well-documented as the origin of much cancer. Coke ovens provide an example of the typical disregard industry has for its workers and the inhabitants of surrounding communities, in particular, members of national minorities. Joel Schwartz writes about the battle to clean up the coke ovens and the leading role of the workers and progressive unions. We include a short piece by Ed Loechler which provides an overview of cancer in the workplace.

Bob Ginsburg and Beth Powers each review *The Politics of Cancer*, an important book by Samuel Epstein. They discuss not only the industrial causes for many cancers but also scientists' complicity in covering industry's tracks. Powers details the asbestos industry's history with cancer.

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CANCER: SOME NOTES FOR ACTIVISTS

by David Kriebel

Cancer is both a scientific and a political issue. It is a scientific issue because it is a heavily researched disease — one whose most basic characteristics are still being uncovered and one about which honest and less-than-honest differences of opinion exist among scientists. It is fundamentally a political issue because cancer is a disease with social causes, for which both the blame and the suffering are shared disproportionately by different social classes.

This article addresses those who are confronting cancer politically: health activists, union health and safety workers, and environmentalists. Several recent developments in cancer research are relevant to the strategies pursued by anti-cancer activists. The relationship between political strategy and underlying social and biochemical conditions should be a dynamic one — strategy advancing with increased knowledge of the disease, of its causes, and of prospects for a cure.

I will discuss four interrelated points. First, cancer, known to be an amalgam of many different diseases, must now be considered a part of the broader issue of *genetic toxicology*. Things that cause cancer are likely also to cause birth defects, and may cause permanent damage to human genes as well. Second, cancer's causes are mostly environmental, but environmental causes include more than pollution, food additives, and synthetic chemicals. Third, there are natural as well as synthetic carcinogens. Fourth, preventing cancer means eliminating the carcinogens of human (mostly corporate) origin, limiting exposure to carcinogens that cannot be eliminated, and changing hazardous aspects of our lifestyles.

David Kriebel is a member of the St. Louis chapter of SftP, and a research associate at the Center for the Biology of Natural Systems at Washington University. His research is in occupational cancer epidemiology.

The Unity of Genetic Toxicology

Many, probably most, cancers are caused by damage to DNA, the genetic material contained in every cell(1). But cancer is just one of a number of results of a mutation, as an alteration of genetic material is known. A mutation in a non-reproductive, or somatic, cell is usually lethal to that cell. Rarely, a mutation damages the cell's normal growth and replication behavior, and a tumor can be the result. If a mutation occurs in a germ cell — a sperm, sperm-producing or egg cell — a genetic birth defect can result. If the mutation occurs in a developing fetus, particularly in the early weeks of pregnancy, a developmental birth defect can result.

Chemicals which cause DNA damage are called mutagens. We now know that carcinogens and teratogens (substances which cause birth defects) are both mutagens. The unity of these three groups has only recently been recognized and has many important implications. All chemicals which can damage DNA must be presumed capable of causing cancer and birth defects, until proven otherwise. This view conflicts with some recent efforts by industry to remove only women from certain occupations because of risks to the fetus. Because birth defects can result from mutations in male sperm cells as well as in ovaries and the fetus, neither women *nor* men should be exposed to substances suspected of being teratogenic.

In 1977, when the pesticide DBCP was found to cause infertility in male workers, the National Peach Council seriously proposed allowing only workers who wanted no more children to work with it(2). This idea ignored the unity of genetic toxicology; DBCP is also a carcinogen.

Perhaps the most frightening possibility raised by the recent research on mutagens is that of permanent ef-

fects on the entire population through genetic damage. If mutations occur in germ cells, they may be passed on to the offspring — either as obvious, often lethal birth defects, or as subtle changes in resistance to disease, physical fitness, longevity, etc., which may never be detectable, and if detected will be irreversible anyway.

Ten years ago, a group of geneticists, biochemists and physicians had this to say about the mutagenic potential of chemicals in the environment:

There is reason to fear that some chemicals may constitute as important a risk of human mutations as irradiation, and possibly a more serious one. Although knowledge of chemical mutagenesis in man is much less certain than that of radiation, a number of chemicals — some with widespread use — are known to induce genetic damage in some organisms. To consider only radiation hazards is to ignore what may be the submerged part of the iceberg.(3)

The Ninety Percent Law

The idea that somewhere between 75 and 90 percent of cancer is environmentally caused has been adopted by environmental health activists as their principal article of faith. Literally interpreted, this “law” is well-accepted among cancer scientists, even those employed by industry. The problem is that the meaning of “environmental cause” has been widely misconstrued.

The studies used to estimate the environmental contribution to human cancer are simple in concept. Several scientists, notably Sir Richard Doll(4), compared cancer rates in various parts of the world. His assumption was that the *lowest* observed rates represent

genetic causes, and that all levels above that must be due to factors of the environment in which these higher rate groups live. Additionally, populations that migrate from one environment to another nearly always attain within two generations the cancer rates of the native inhabitants of their new environment(4). Environment, in these studies, means everything but the anatomy and physiology of the person who develops the disease (viral causes of cancer, accounting for just a few percent of all cases, are also generally not included in the “environmental” category). This includes air and water pollution, food additives, and occupational hazards; but it *also* includes cigarette smoking, alcohol, sunlight, naturally occurring food-borne carcinogens, natural background radiation, and other unknown but “natural” causes.

The assumption of many activists is that pollution, synthetic chemicals, and radiation are *the* environmental causes, and are responsible for some 75 to 90 percent of all cancer. This is incorrect. What fraction of cancer is caused by pollution, synthetic chemicals and radiation alone? We don't know, but it certainly is very large. A recent government study estimated that 20 percent of all cancers are probably of *occupational* origin.(5) When we add to this all the cancers caused by air, water and land pollution; synthetic chemicals intentionally placed in the home and food; drugs; medical x-rays; and radiation from the nuclear power and nuclear weapons industries — cancers originating in human activity obviously constitute an enormous proportion of all cancers.

Synthetic versus Natural

Barry Commoner has for many years been reminding us that a synthetic chemical is far more likely to be harmful to us and to the environment than a naturally occurring one(6). Naturally occurring chemicals have stood the test of time — they have been with us throughout our evolutionary development, and so are likely to be compatible with our physiological processes. Synthetic ones have mostly been invented or inadvertently produced only in the last few decades. They were rarely tested for compatibility with life before being mass produced.

Not only activists, but a large part of the population, now believe that “natural” is better than synthetic. This is a good initial assumption, but is far too simple to serve as a guide for public policy. There are natural carcinogens. They cause cancer, just like the synthetic ones. Health activists often wish they would go away. They confuse things. The mold *Aspergillus flavus* grows on peanuts. It also produces chemicals called aflatoxins which are among the most potent chemical carcinogens known. Industry has a field day with natural carcinogens — they say things like “the risk of cancer from



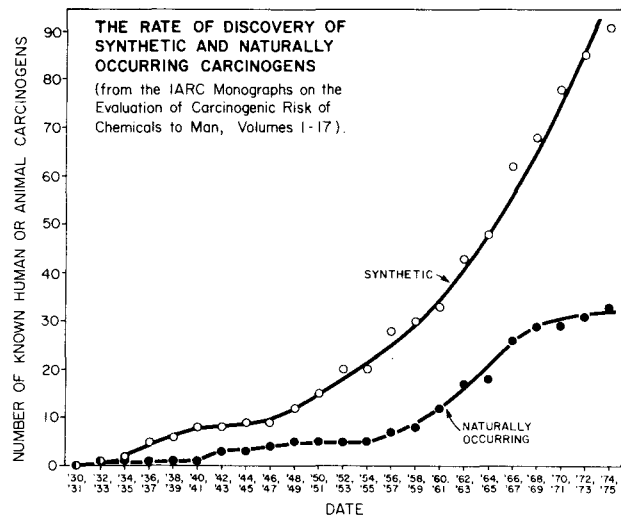
eating peanut butter is much greater than from eating our nitrite-treated hot dogs, so why ban the nitrite?" The science of cancer-risk estimation is so imprecise that they don't really have a case here, but the charge certainly does confuse the issue. Environmental health activists play into the hands of their critics when they do not prepare the public for a situation more complex than "natural-good, synthetic-bad."

It is not at all hard to see that the existence of natural carcinogens does not justify making new ones, but on top of this, there are two important reasons for the regulation and elimination of synthetic carcinogens. As the accompanying graph (courtesy of Barry Commoner) shows, the synthetic carcinogens are being discovered far more rapidly than the natural ones. Although the data are not available, we are fairly certain that the effort spent looking for the two types has been about the same. The difference, therefore, is due to both the higher absolute number of synthetic carcinogens, and the fact that new ones are being produced all the time (some 700 new chemicals are manufactured every year [7]). From the look of the lower curve, we do not expect to find too many more natural carcinogens. The second reason to aim the attack at the synthetics is that many of them are entirely unnecessary. As detailed elsewhere in this issue, too many synthetic chemicals are produced for their profitability, *not* their necessity.

Most antinuclear activists understand that there is both natural radiation and radiation of human origin. We simply say that all radiation is bad, and even the most minute addition to our natural burden should be avoided. We note that radiation-induced leukemia has no threshold, no level of radiation so low that no leukemia risk is incurred. A similar argument must now replace the "natural-good, synthetic-bad" line on chemicals. The presence of natural carcinogens is all the more reason not to add synthetic ones to the genetic hazard.

Blaming the Victim/Ignoring the Obvious

The environmental carcinogens can be divided into two categories: those that we are exposed to more or less voluntarily and those that we are exposed to involuntarily. The "voluntary" exposures are sometimes called life-style factors — smoking, drinking and diet are the main ones (although a strong argument can be made for the involuntary nature of smoking and drinking, they are certainly *more* voluntary than water and food contaminants, air pollution, and workplace fumes). The corporate position is one which strongly stresses the voluntary risks, and minimizes the involuntary ones. In response, many environmental health activists *ignore* the



Used with the permission of Barry Commoner

lifestyle factors, because their political strategy targets the corporations and their pollution. Neither approach alone is correct.

For example, tobacco smoking is a major cause of lung cancer and cancer of numerous other sites — the epidemiological and clinical studies are consistent and overwhelming(8). Numerous dietary factors certainly influence cancer susceptibility, both positively and negatively(9). The anti-smoking forces generally buttress their position with tables showing what percent of cancer is caused by smoking, what percent by occupation, what percent by diet, etc. The trouble with these tables is that they generally add up to 100 percent. That is, they attribute each case to a single cause. To which cause should the death of a smoking chemical worker be attributed? Usually the "smoking" category gets it. But why not attribute it to the occupation? A correct table of cancer causes would add up to more than 100 percent because of multiple causes. We currently lack the data to make such a table accurately.

Is there really a dichotomy between fighting pollution to control cancer, and changing lifestyles to control cancer? Perhaps not so much as some may think. Most activists attack the cancer-causing aspects of the *production* side of the capitalist economy. Air and water pollution, occupational hazards, and toxic waste dumps are all poisonous aspects of the production of goods. But as we all know, corporations only produce these goods to sell them. The *consumption* of these goods has cancer-causing effects too. The consumption of cigarettes, of alcohol, of overly processed food, of polluting automobiles — these are precisely the "lifestyle" issues which need changing.

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ABOUT THIS ISSUE

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In "The Politics of Cancer Research," John Valentine examines funding for cancer research and who gets it. He lays bare a complex web in which government, public, and private institutions interlock to insure that only profitable "cures" for cancer are likely to be discovered. He cites areas where much-needed research is under-funded.

If the causes of cancer are so well-known, why don't we eliminate them? In posing this question, Carol Horowitz summarizes many of the points in the previous articles. While some people suffer from cancer, certain establishments benefit. Rather than stopping cancer, government, medicine, and industry have turned it into an institution. In particular, the abuse of women by modern treatments is scrutinized. She concludes, as we do, with a call to action. □

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WE NEED TO RAISE \$25,000 THIS YEAR

Comparing Apples to Oranges

RISK OF COST/BENEFIT ANALYSIS

by Barry Commoner

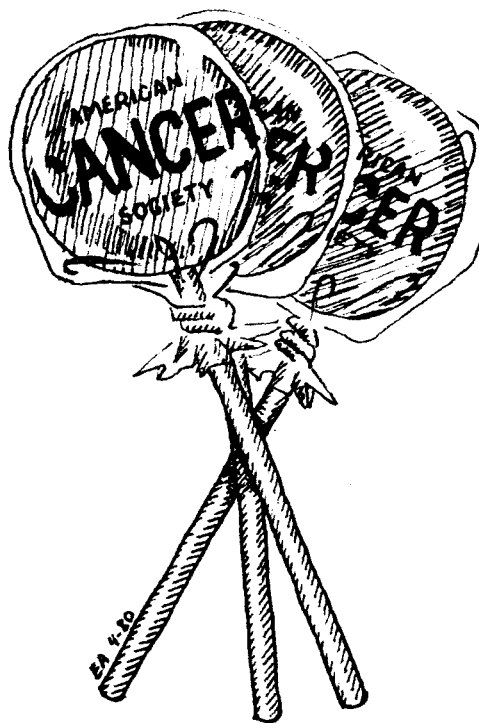
Not long ago there was a curiously symbolic clash between two well-meaning public interest groups, the American Cancer Society (ACS) and the Center for Science in the Public Interest. The subject was lollipops. It seems that certain chapters of the Society were selling lollipops to raise money to fight cancer. Some of the lollipops were red ones, and according to the Center, Red Dye No. 40, which they contained, is a suspected carcinogen. The Center wants the Cancer Society to stop selling the lollipops. The Society has replied: "Until Red Dye No. 40 or any other additive has been declared unsafe and taken off the market, its use in manufactured products is perfectly proper."

Does the ACS think that smoking cigarettes is "perfectly proper" because they have not been taken off the market? Clearly, the Cancer Society would not dream of raising money by selling cigarettes. Apparently, the Cancer Society believes that smoking cigarettes is a more serious risk than sucking red lollipops. But how does one make such comparisons?

As the concern about the risks of modern technology to people and the environment has been translated into legislation, a basic idea has emerged — that the best way to evaluate such a risk is to compare it with the associated benefits. This is known as risk/benefit assessment. The most recent legislation based on this concept is the Toxic Substances Control Act (TSCA). This act requires that the Environmental Protection Agency (EPA) administrator establish rules for governing the production and use of chemicals which take into account not only a substance's toxic hazards but also "the

benefits of a substance for a given use or uses and the availability of less hazardous substances for the same uses." One important section of the TSCA law requires what might be called a meta-cost/benefit assessment. This is a cost/benefit evaluation not only of the substance but also of the EPA decision to regulate it — that is, the social cost of administrative action itself.

Although TSCA does not apply to food additives, it is, nevertheless, the most clear-cut statement of the risk/benefit principle and it is an interesting exercise to apply it to the red lollipop controversy. Let us assume



Barry Commoner is director of the Center for the Biology of Natural Systems at Washington University in St. Louis. This article is a condensed version of "Should this Sucker Get an Even Break?" which appeared in Hospital Practice, March 1979.

that a small cancer risk is associated with Red Dye No. 40, and that the dye adds no nutritional or taste value, so has no benefit to the consumer. With the dye in it, however, the lollipop might be said to be more “appealing” than blue ones or yellow ones. Translated, this means that they sell better. Hence the red dye is of benefit to the people that manufacture and sell the lollipops, not to the consumers. However, the hazard associated with the dye is directed toward the consumers of the lollipop, not the sellers. Since environmental regulations are designed to protect people who are exposed to toxic substances rather than the people who manufacture and sell them, it would be reasonable to conclude from this assessment that however small the risk of a toxic effect from the dye, it outweighs the benefits, since there are none. But regulatory action against Red Dye No. 40 could be challenged on the basis of economic and social impact — jobs and profits.

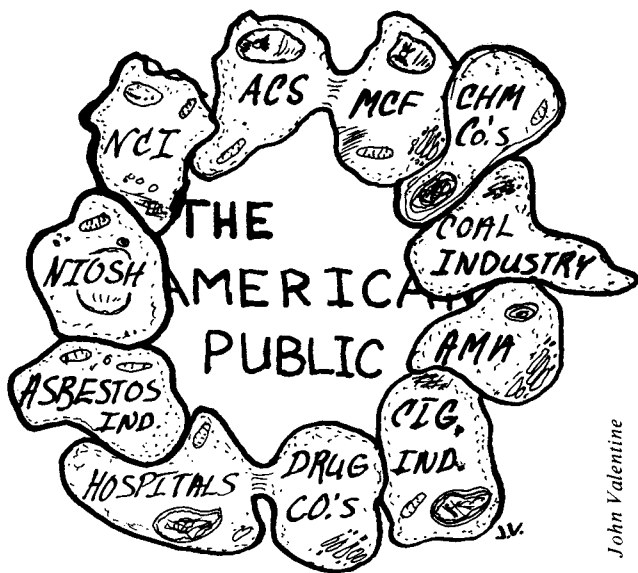
Taking all this into account, how could the Cancer Society, or the rest of us, decide about the relative importance of doing something about cigarettes and red lollipops? How do you compare the importance of controlling one possible carcinogen with another? This is the central question of the growing debate on carcinogens. There is, as yet, no generally accepted logical answer to it; but consider for a moment an *illogical* answer.

Suppose we compare the costs of a regulatory action that might be taken against cigarettes or red lollipops — banning them. Banning cigarettes would wipe out a \$6 billion industry (in annual sales), whereas banning even all uses of Red Dye No. 40 would eliminate sales of only a few million dollars per year. Clearly, the social costs of banning red lollipops are much smaller than the costs of banning cigarettes. But this fact would, of course, be a palpably illogical basis for action, since cigarettes are more dangerous. The logical fault is obvious: In a risk/benefit assessment what should be compared is risk and benefit associated with the *same* substance, not risk (or benefit) of Substance A with the risk (or benefit) of Substance B.

Yet this is just what is now being proposed by the chemical industry. We are told that “we do not live in a risk-free world and a balanced policy on carcinogens must take this into account.” The American Industrial Health Council (an industry lobby) gives us tables comparing cancer risk with other hazards. The tables tell us, for example, that people who frequently fly the airlines incur the risk of fatality with a probability of .0015% per year; that the comparable risk of cancer from an average medical diagnostic X-ray is .001% per year; that the risk of a fatality from playing football is .004% per year; from canoeing, .04%; and from motorcycle racing, 1.8% per year. The report points out that, “Society has chosen not to prohibit any of these activities, or even activities with much higher risks. There are a few activities which pose such a high risk that society has banned them completely (e.g., going over Niagara Falls in a barrel).”

What is the Health Council trying to tell us? Since a 1.8% risk of death per year (motorcycle racing) is acceptable, but a risk of 100% (Niagara Falls in a barrel) is not, do they think we ought to ban a chemical when its risks lies between these two limits?

This logic is reminiscent of a much acclaimed report to the Nuclear Regulatory Commission (and just recently repudiated by it) that decided, on the basis of very elaborate computations, that the risk of being killed by a nuclear reactor accident was about the same as the risk of being hit by a meteorite. Such a “risk assessment” approach destroys the logic of the risk/benefit concept just as surely as does the comparison of the regulatory costs of banning cigarettes and Red Dye No. 40. Its proponents would do well to ponder the moral of the Cancer Society’s red lollipops: What counts is the lollipop’s risk in relation to the lollipop’s benefits. When the dye’s contribution to that benefit is zero, the relative risk (however small) becomes, so to speak, infinitely large. This suggests that it may be unnecessary to make elaborate, relative estimates of the risks of many toxic chemicals because, like the color of the lollipop, their benefits are zero. □



ABNORMAL PROLIFERATION

It's the Real Thing

COKE OVEN CANCER

by Joel Schwartz

Coke batteries are like a classical conception of hell, with workers doing their jobs amid fire and brimstone. Besides being extremely dirty and unpleasant, work in coke ovens exposes workers to high levels of carcinogens. As a result, coke oven workers have high rates of cancer. Coke plants contribute significantly to air pollution in residential areas near mills, increasing the lung cancer rates among residents.

For nearly a decade a major battle has been waged over conditions in coke plants. While the steel industry has resisted clean-up efforts tooth and nail, the United Steel Workers of America (USWA), prodded by rank-and-file coke oven workers, has won definite improvements in conditions in coke plants. Still, most plants did not comply with the Occupational Safety and Health Administration's (OSHA) new standard for coke ovens

by the January 1980 deadline, despite the standard's technological feasibility(1). (The standard is far less strict than needed to protect workers' health anyway.) The American steel industry has seen repeated plant closings and layoffs, and the threat of further, more massive layoffs hangs over the workers. Although steel companies claim that a clean-up is too costly and would further damage their ailing industry, inexpensive methods are available to reduce pollution levels. The scientific community has played its part in the drama, with many scientists involved in covering up the possible

Joel Schwartz teaches Environmental and Occupational Health Sciences at the University of Illinois School of Public Health. He works in the area of environmentally caused cancer, and is an active member of the Chicago Area Committee on Occupational Safety and Health (CACOSH).



Militant

health hazard, and a few playing an important role in documenting the hazard.

Racism is also involved. The steel industry has a long history of keeping workers divided by assigning jobs according to race. Coke plant jobs, among the dirtiest and most grueling, have traditionally gone to black and other minority workers. Additionally, the communities surrounding many mills tend to be disproportionately black and minority.

Coke ovens (arranged in batteries) are an essential part of the steel-making process. Coal is heated in the ovens to very high temperatures, giving off impurities, and leaving coke which is essentially pure carbon. The coke is used as a reducing agent and fuel in the blast furnace. In the process of coke production a number of carcinogenic substances are produced in large quantities, including benzpyrene (BP), benzene, phenols, anilines, and sulfur dioxide (which has been shown to increase the potency of carcinogens). A study by Dr. J.W. Lloyd, published in the early 1970s, showed that topside workers (who work on top of the coke ovens) with five or more years experience had a lung cancer rate ten times that of the general steelworker population, and coke oven workers overall had a lung cancer rate 2½ times that of the general steelworker population (2). Subsequent studies confirmed these results, and all showed that coke plant workers suffered from excessive rates of kidney and prostate cancer, as well as of chronic lung disease and heart attacks. To get an idea of what a ten-fold excess lung cancer rate means, it should be noted that normally lung cancer accounts for about 5 percent of all deaths among men in the U.S.

There are some 22,000 coke oven workers in the U.S., with a disproportionately high number being black and other minorities (3). When Lloyd first analyzed his data, it appeared that the excessive cancer rates appeared only among blacks. Further checking revealed that when proper controls were made for place of work, the cancer rates depended only on place of work and had nothing to do with race. However blacks tended to have the dirtiest jobs.

The Fight Back

The first activity by steel workers in recent years to improve conditions was initiated by Dan Hannon, president of the USWA local at U.S. Steel's Clairton works near Pittsburgh. Hannon noticed that death and disease rates among workers in the coke plant seemed to be very high. He took his case to Washington, testifying before House and Senate Committees about conditions in the coke plants. Back in Pittsburgh he spoke at several local unions and was instrumental in educating workers and organizing them to demand improved conditions. U.S. Steel attempted to harass and intimidate Hannon for his

efforts, for example by shifting him to a work area where no phone was available, which made it very difficult to be a local president. The intimidation tactics did not work, and Hannon continued his efforts.

Soon after activities began in Clairton, Lloyd's study was published and received widespread publicity. The newly formed OSHA, fresh from winning stricter standards for asbestos and vinyl chloride, moved to adopt a new coke oven standard. The steel industry had already been trying to get the old standard tossed out, and geared up for a massive battle to avoid a major change. The USWA mobilized its forces to fight for an improved standard, but its ability to fight was limited by the non-struggle position of leaders who had negotiated a no-strike agreement, and whose racism made them unwilling to go all out for the sake of mostly black and minority workers.

Both the old and new standards deserve comment. The old standard for coke oven emissions was 0.20 milligrams of particulate matter (called the benzene soluble fraction) per cubic meter of air (mg/m³). It was apparently arbitrarily set, as the standards committee gave no scientific reason for selecting that figure (4). Although the hydrocarbons in coke plant emissions have since the 18th century been known to cause cancer, and several studies (5) from the U.S., Great Britain, and Japan document very high cancer rates among workers, several important articles in the U.S. literature state that the cancer threat from coke ovens is either slight or non-existent (6). These articles played an important role in supporting the previous standard.

The new coke oven emissions standard, set by OSHA and backed by USWA, is 0.15 mg/m³ of benzene soluble fraction, or 75 per cent of the old standard. If enforced, this standard would be a big improvement, because actual exposure levels in coke ovens generally exceed the exposure limit by a factor of 10 to 100. The new standard also carries a provision requiring yearly medical exams for coke plant workers, which is an important benefit. Still, this standard will not eliminate lung cancer from coke oven emissions. It was revealed that the standard was set by determining the lowest level of emissions that OSHA considered economically feasible for the steel industry to achieve (7). The exposure level in the standard was set to equal the levels at the Fairfield, Alabama plant of U.S. Steel, deemed the best in the nation for controlling emissions. It was in no way based on an attempt to meet a certain level of health protection.

While the USWA committed itself to having the standard implemented, rank and file coke plant workers in several areas took action to pressure the union to take a stronger stance and obtain improvements in local conditions. One local in Canada won for coke plant workers four hours relief time for every four hours

worked. In Sparrows Point, Maryland, a work stoppage by coke plant workers resulted in guarantees by the company to make major improvements in coke oven conditions. In Fontana, California, coke plant workers from Kaiser Steel jammed a meeting of the State Air Resources Board demanding a cleanup. A few years later the Board forced Kaiser to sign a consent order which committed it to make major improvements. Workers at the Inland Steel plant in Indiana came close to striking over the coke plant workers' demands. These included four hours relief time for every four hours worked and greatly increased oven maintenance. Neither was granted. The latter demand would have increased jobs, and lowered pollution levels, as much of the exposure results from leaks and poorly fitting doors on the ovens, problems which could be resolved by proper maintenance.

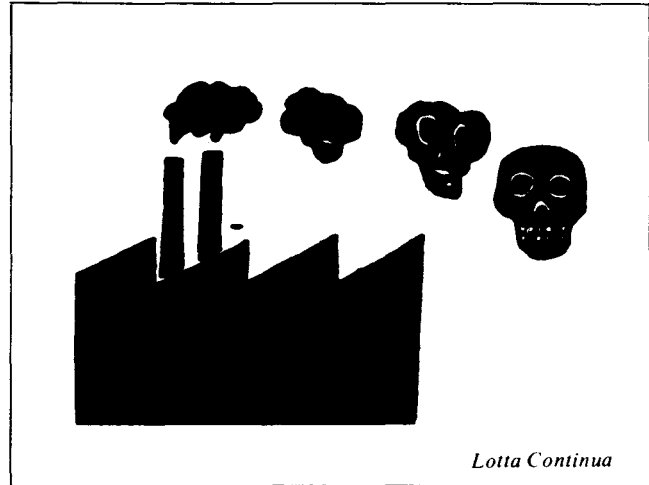
The steel monopolies did everything they could to block implementation of the new standard. One channel they used was the courts. The USWA spent \$1 million and a large amount of time and effort in a successful defense of the standard which wound up being decided by the Supreme Court. The steel companies' main arguments were that the steel industry was in a crisis, and that the new regulations were so costly they would result in massive layoffs and general devastation of an already suffering industry. The truth is that meeting the regulations would eat into the industry's high profits slightly, but overall the cost would be small compared to their profits (1). In fact, exposure could be reduced to far lower levels than required by the OSHA standard — at relatively little cost (1). Furthermore, although there is a crisis in the U.S. steel industry, the blame falls on the excessive profits of the industry, and it will not be solved by attacking working conditions and living standards of steel workers. In spite of the crisis, profits in the industry are high, about 50 percent higher in 1979 than in 1978.

Emissions Control

Technology is available to reduce greatly the exposure levels, and at reasonable cost. For example, a half dozen methods are available for reducing emissions during the loading of coke into the ovens — called charging, a major emissions source. An enclosed pipe system for loading coal into the ovens could be built into new coke ovens for less than the cost of traditional systems (1). Unlike the old system of loading the coal from a rail car on top of the oven through an open door, little gas escapes into the air from a pipeline.

For older ovens a jumper system could be installed cheaply. In this system, gases from the oven being charged are moved by suction through a jumper pipe to another oven, rather than escaping into the atmosphere. Another system, now in use at the Jones and Laughlin

steel mill in Pittsburgh, uses greater steam pressure to suck up coke oven gases, blocks gas escape routes, and uses special doors to seal hoppers on the loading cars. These systems cut emissions from the charging process by about 85 percent. The cost of installation and operation of either system has been calculated at less than 1 percent of the cost of coke (1).



The quenching operation, the cooling of the hot coke, is another major source of pollution in which emissions can be readily reduced. Coke is usually quenched in the U.S. with waste water, causing a subsequent release of high levels of pollutants with the steam into the air. The dry quenching process uses inert gases (nitrogen and carbon dioxide) to absorb heat from the coke. The gas then transfers the heat to a waste heat boiler to make steam which can be used to make electricity or preheat coal. Emissions from quenching are reduced by over 90 percent by this process (1). Dry quenching systems are used in steel mills throughout the world, including mills in France, Germany, Czechoslovakia, the Soviet Union, and Japan. Although conversion from wet quenching to dry quenching requires significant capital investment, the savings from capturing the waste heat and producing superior coke make these investments pay for themselves in four years. One dry quenching operation is being planned for a steel mill in Weirton, West Virginia, but this only with financing by the Environmental Protection Agency (EPA). Apparently U.S. steel companies are avoiding the method because they prefer to put capital into more profitable investments outside the steel industry. Much of the record profit now being made by U.S. steel monopolies is being sunk into the mining industry in such countries as South Africa and Brazil.

In general, the steel industry has attempted to blame recent plant closings in large part on environmental as well as health and safety regulations, but these

accusations are false. First, with expenditures of about 1 percent of steel production costs, emissions levels for coke ovens could be reduced to far below that required by the OSHA standard, and in the long run some pollution control techniques would save money (1). In other countries steel producers have installed more pollution control devices, met stricter standards, yet still produced steel more cheaply than their U.S. counterparts. Bernie Bloom, Director of the EPA Enforcement Division, studied pollution control technology in Japan, a

nation which produces many types of steel at 80 percent of the cost in the U.S. He concluded that the Japanese steel industry had installed technology in all its new plants which far surpassed technology in place in the U.S. Every coke oven in Japan had hardware for capturing pushing emissions and desulfuring coke oven gas (8). In another country, the Soviet Union, the use of the dry quenching method is mandatory.

The main reasons for the steel crisis and the closing of steel plants are that demand for steel in the U.S. is

Cancer and the Workplace

As the problem of cancer resulting from exposure to industrially generated chemicals has come to light, a controversy has arisen as to its importance. Some epidemiologists and members of the American Industrial Health Council (AIHC), a coalition of various industrial concerns, estimate that at most 5 percent of all cancers result from exposure to industrial chemicals (1). Unfortunately, the numbers from which these estimates were derived cannot be found in their respective publications.

Recently, a rather large group of epidemiologists at the National Cancer Institute (NCI), the National Institute of Occupational Safety and Health (NIOSH), and the National Institute of Environmental Health Sciences (NIEHS) have estimated that 20-38 percent of all cancers might be due, at least in part, to occupational exposure (2). Their evaluation is based on a simple calculation involving estimates of the increased risk of cancer from exposure to a specific substance, and estimates of the number of workers exposed to that substance. There is sufficient data to make this type of calculation on only a limited number of recognized human carcinogens, including arsenic, asbestos, benzene, nickel, chromium, coal tar pitch, coke oven emissions, iron oxide, and vinyl chloride.

The following are examples of the findings: Of four million workers who have had heavy exposure to asbestos, 20-25 percent can be expected to die of lung cancer, 7-10 percent of mesothelioma (cancer of the lining of the lung), and 8-9 percent of gastro-intestinal cancer. Coke oven workers face two-and-a-half times as great a chance of dying from lung cancer and are seven times as likely to die from kidney cancer as the general population. Smelter workers heavily exposed to arsenic trioxide for more than 15 years had an eight-fold excess of respiratory cancer. Other well-known occupational carcinogens include vinyl chloride, bis-chloromethyl-ether, benzene, and benzopyrene. In a retrospective study of a coal tar dye plant where benzidine was used, 44 percent of the workers exposed to benzidine developed bladder tumors. Another study showed that 94 percent of workers exposed to benzidine and beta-naphthalene for over five years developed bladder tumors.

Certain groups of workers are known to have higher

incidences of cancer, although the exact agent responsible is unknown. For example, barbers are known to get more larynx cancer, painters more leukemia and stomach cancer, leather and shoe workers more nasal cavity and sinus cancers, and chemists more lymphomas, leukemias, Hodgkin's disease, and pancreatic cancer.

U.S. counties in which certain types of industries are located are known to have higher rates of certain types of cancer; for instance, counties with rubber industries have more leukemia and prostate cancer, chemical industries more stomach and bladder cancer, paper industries more lung cancer, and petrochemical industries more cancers of the lung, skin, nasal cavity and sinuses.

It should be made clear, however, that all the studies of cancers resulting from industrial chemicals have been made on chemicals used for many years. No one can predict the effects that the great boom in organic chemical production, which began around 1945, and continued to grow rapidly into the 1970s (3) will have on cancer incidence in the future. The reason for this is that there often is a 20-40 year lag period between first exposure to a substance and the first appearance of cancer symptoms. Thus the cancer incidence resulting from the boom in chemical production may only be beginning.

Do we have reason to expect an increase in cancer incidence from this boom? Unfortunately, yes. While the Occupational Safety and Health Administration (OSHA) currently recognizes and regulates only 20 chemicals as human carcinogens, the International Agency for Research of Cancer (IARC) lists 221 chemicals for which there are good data indicating animal carcinogenicity, and NIOSH lists over 2000 chemicals as suspected carcinogens. There are currently 60-70,000 chemicals in production, and the list is expanding at a rate of about 700 per year. Unfortunately, many have not been tested for carcinogenicity. In addition the current Threshold Limiting Value (TLV) for a number of chemicals allows workers to be exposed to a daily dose very close to the dose known to give cancer to 50 percent of exposed experimental animals (after correction for body weight differences). Although these facts cannot be used to reliably predict the future, they suggest an alarming potential problem.

low (9) and that the U.S. steel industry has let plants run down by refusing to install new equipment or properly maintain old equipment. Two plants that were closed recently, the Youngstown Sheet and Tube and the Lackawana works of Bethlehem Steel, were closed because they were in bad repair and saddled with obsolete technology. A recent *Journal of Commerce* article noted, "Steel companies are closing older plants and laying off thousands of workers in an effort to reduce costs and improve profit margins." (10)

To deal with this problem, OSHA, under its current progressive leadership, has recently released its so-called "Generic Carcinogen Standards." (4) OSHA estimates this new procedure will allow 10 new substances per year to be regulated as carcinogens, an improvement from the previous rate of about two per year. Labor finds this improvement a step in the right direction, but insufficient given the magnitude of the problem. In spite of the concessions made by OSHA to industry regarding the standards, the AIHC and others have filed for federal appeals court review of the policy, which will undoubtedly delay its implementation for years.

While the courts decide on the appropriateness of the OSHA standards, and scientists debate just how many workers are victims of occupational cancer, the incontrovertible point is — an improved policy is needed because too many workers are dying. Even if we accepted the conservative figure of 5 percent of all U.S. cancer deaths being due to occupational exposures, that amounts to 20,000 deaths per year. And unlike cancers due to so-called "lifestyle" factors (e.g., cigarettes and alcohol), these cancers are totally imposed on people. — workers have no choice over production priorities or production methods. Occupational cancers are a problem we can prevent now.

—Ed Loechler

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Moreover, lowering emissions at existing plants creates, rather than eliminates, jobs. Strict maintenance, repairing doors, plugging leaks requires more workers but slows down production. At the U.S. Steel plant at Fairfield, 16 to 22 workers per unit shift were added to enforce the new coke oven standard. Similar changes took place at the Clairton plant.

The Environmental Hazards

Coke oven emissions constitute a serious health hazard to the surrounding community as well as to coke oven workers. The EPA estimates that coke oven operations contribute about 19 percent of the nation's air pollution burden of BP, and about 15 percent of polycyclic and aromatic hydrocarbons (11). They are also major sources of gaseous hydrocarbons, sulfur oxides, and nitrogen oxides, many of which cause cancer.

Since most of these emissions are concentrated in the vicinity of coke ovens, the health effects on people living near plants are much more pronounced than the 15- or 19-percent figure would indicate. The most recent EPA figures state that the average ambient air concentration of BP for cities with coke ovens is 1.21 nanograms per cubic meter (ng/m³), compared to 0.78 for 13 cities surveyed without coke ovens, and less than 0.1 for rural areas (11). For the benzene soluble fraction of particulate air pollution, the figures are 4.21 micrograms per cubic meter for coke oven cities, 3.75 for cities without coke ovens, and 0.95 for rural areas (11).

Even more pronounced differences can be seen when air concentrations of BP at different areas within cities are considered. For example, in Allegheny County, Pennsylvania, the average air concentration of BP varies from 51.95 ng/m³ at a site 2 kilometers from the U.S. Steel plant, to 1.64 at another site. Four of the eleven sampling stations had average readings in excess of 10 ng/m³ (11).

The EPA estimates that over 200,000 people in the U.S. live in areas where the ambient air concentration of BP from coke oven emissions alone exceeds 10 ng/m³, and almost one million people in regions where the contribution from coke ovens exceeds 5 ng/m³ (compared to a 0.38 ng/m³ average for cities without coke ovens). More than 8 million people live in cities where coke ovens contribute 1 ng/m³ of BP or more to the air. Thus coke oven emissions make a substantial contribution to urban air pollution.

Numerous studies have linked high lung cancer mortality rates to living in more polluted areas. Similarly, chronic respiratory disease has been attributed to exposure to both particulate air pollutants and sulfur oxides. While no studies have been performed that directly link coke oven emissions to either of these diseases, there is ample evidence indicating that pollution from coke ovens makes a serious contribution to cancer among people residing near plants.



On the job

An analysis of lung cancer mortality rates of counties with coke ovens reveals higher rates in these counties than in the state as a whole and in neighboring counties. The rates are, in general, higher for both men and women. These differences in mortality are in some instances very high, up to 40 percent. The rates for women generally show the same pattern as for men, which tends to indicate that the differences are due, in part to ambient exposures, not simply to workplace exposures. Women were not employed in steel mills in significant numbers during the period of the study.

The Situation Today

The January 1980 deadline for compliance with the new coke oven standard has passed, but the battle to end the carnage continues with greater interest and participation by coke oven workers. There have been some major improvements to date, but the powerful steel industry, aided by the deepening steel crisis and a media blitz about how regulation is ruining our economy and causing inflation, has successfully dragged its feet in many instances. Two years ago, an OSHA inspection at the Indiana plant of Inland Steel indicated that exposure levels for many workers were still ten to 100 times those permitted by the standard. Only one plant had met the OSHA standard by the required date, and most are far from compliance. OSHA has not announced how it will deal with plants not meeting the standard.

The actual situations vary from plant to plant. In most coke batteries workers report some changes — new ventilating systems have been brought in, spare

doors have been purchased, more time is allowed for maintenance, and some mills have even installed pipeline changing. Most of these changes have come as a response to OSHA inspection (OSHA has a special team of experts whose only function is to inspect coke plants), but many workers fear backsliding after the inspectors leave.

Several steel locals are also fighting to reduce pollutant levels in the community. There is a close connection between the workplace and community pollutant levels as the same process changes and maintenance improvements that would reduce workplace pollution would also reduce ambient pollution. Three USWA locals have asked to participate in EPA suits to make the plants comply with environmental regulations. The workers argue that the EPA cannot by itself properly monitor emissions, but that they, because of their position in the plant, can determine when doors are not cleaned or replaced, when pipelines are leaking, when coke is incompletely charged, and, in general, when proper procedures to control emissions are not followed.

The USWA has been sponsoring conferences for coke oven workers throughout the country, which have had broad rank and file participation. At a recent conference in the Illinois-Indiana district, coke workers formulated demands for the coming contract including 4 hours relief time for every 4 hours worked, full disclosure of medical test results, full compliance with the OSHA standard, and adequate maintenance crews with sufficient time to clean doors and plug leaks. The mood of workers at the conference was militant and optimistic. Despite the economic hardships in the industry the workers fully intended to "get the coke plants off Death Row," as the buttons they sold declared. □

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book review

by Bob Ginsburg

The Politics of Cancer

Samuel S. Epstein

Anchor Press/Doubleday, 1979

\$6.95

The impact of the physical and social environment on our health and on the incidence of disease has been recognized, if not accepted, for over 100 years. By the end of the 19th century, TB, cholera, and the plague were firmly linked to the overcrowding and unsanitary living conditions associated with urban pollution and poverty. Already in the 18th century scrotal cancer (in chimney sweeps) was linked with soot. Yet in many ways such knowledge has had little effect. Among patients in hospitals serving big city ghettos, TB is still rampant. Machinists show high levels of scrotal cancer. Infant mortality levels are directly related to socioeconomic levels. Our environment must still be affecting our health.

We constantly hear about the deterioration of our environment caused by modern pollution, but some people would like us to believe that such "modern pollution" is not as harmful as the 19th century variety. A recent article in *Chemical and Engineering News* went so far as to suggest that the problems of pollution, toxic chemicals, and cancer had reached crisis proportions primarily because of biased reporting and exaggeration by the news media.

Many researchers blame the increase in heart disease and cancer,

the two leading causes of death in the last 40 years, primarily on changes in lifestyle and personal habits, such as increased cigarette smoking and poorer diets. Those same people also minimize the contributions of industrial pollution and exposure to occupational or environmental hazards.

However, this viewpoint has not gone unchallenged. We have witnessed in the last 10 years a heated public debate concerning the effects of pollution; nowhere has this contest been as fierce as over the significance of environmental causes of cancer.

The Wrong War?

No one disputes that cancer is the second leading cause of death in the U.S. or that 1000 people die of cancer every day. At issue are what causes it and what should be done about it. The first official attempt at a resolution was a declaration of war in 1971. The goal was to treat the symptoms and find a cure, a time-honored strategy in medicine. President Nixon said he wanted to cure cancer in our lifetime. As in other wars, vast quantities of money were spent, this time on chemicals and equipment. Nine years later we have still not met the enemy. We are neither closer to a cure nor better at treating the symptoms. The chemi-

cal companies, the pharmaceutical houses, and the big research institutions have gained — but those thousand people still die every day, and the toll is increasing.

There were some who argued all along that we were fighting the wrong war. They urged control and prevention, and pushed the facts to support such claims. By 1964 it was generally established that over 70 percent of cancer is environmental and therefore possibly preventable. By 1973 the National Cancer Institute had published maps of the geographical distribution of cancer which implied a strong correlation with pollution. Finally, estimates in the mid-to-late '70s put percentage of cancer due to industrial pollution at 30 to 40 percent, and the percentage due to occupational exposure was at least 20 to 40 percent. It should have been clear that the poor, who could not move, and working people, who generally can't change jobs, were bearing the brunt of the disease just as they had done with TB. The sides were drawn over these issues.

Environmental groups, labor unions and some scientists fought to bring these issues out of the industrial closet and into the public domain. The movement, such as it was, grew in the struggle to establish a safe and healthy environment as a right, not a luxury. It attained some successes, such as passage of the Occupational Safety and Health Act, but has not consolidated any of its gains. The contest enters the '80s in a state of uncertainty.

For many years Samuel S. Epstein has been part of the fight — through research, through books, in testi-

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mony to Congress, and as a labor consultant. *The Politics of Cancer* is his contribution to the debate over the future of the environmental health movement. In it he has pulled together a monumental amount of information on specific carcinogens, on the scientific background to cancer, and on the "scientific" and "non-scientific" opposition to regulation. He directly confronts corruption and distortions on the part of scientists, and industry and government officials who argue against control of various chemicals. By laying out their connections and biases he clearly destroys the myth of objective science and scientists. This is one of the first books that treats cancer as a disease with social origins, which must be treated in a political and economic context. This makes it an important resource for understanding the problems of health and disease in capitalist America.

The Politics of Cancer is overflowing with facts and is designed to convince the reader (and move the reader to convince others) that cancer can and should be prevented. The principal point is that cancer is due to carcinogenic compounds that are dangerous at any level, so that control of these substances can control cancer. The book begins by discussing the scientific basis for cancer research, testing and statistics. Included is up-to-date information on the incidence and distribution of cancer, on correlations of cancers with levels of chemicals in the workplace and the environment, and on the cure rate for cancer (which hasn't significantly changed in the last 20 to 30 years). The sections on cancer epidemiology, which is the only valid approach to proving human carcinogenicity, and on animal testing (bioassays) are clear, concise, and easy to read. They may be the best general descriptions available.

Following this background section are 13 case studies on the

regulation of carcinogens which are divided into workplace hazards, consumer products, and general environmental hazards. Like the first part of the book, the case studies are on the whole readable, understandable and entertaining. The most striking feature of the case studies is the similar scenario of each one: A compound is introduced into the workplace or the environment. Medical people find it to be hazardous. Industry denies or minimizes the hazard by covering up the problem or hiring consultants (supposedly independent scientists) to contradict the claims. Finally the government comes in with too little, too late.

Medical-Industrial Alliance

Epstein has not hesitated to expose the connections of these "independent" scientists, many of whom don't reveal any possible source of bias when giving their opinions. In any event, industry has little trouble finding experts who will deny the carcinogenicity of almost anything from asbestos to cigarette smoke. The extent and implications of this medical-industrial conspiracy are staggering.

The most frightening aspect of this alliance is its low regard for the lives of workers. Industrialists evidently think nothing of withholding information on hazards while thousands or tens of thousands of workers die. Asbestos provides the most blatant example. (See box.) In 1935-37 executives of Johns-Manville, the world's largest supplier of asbestos, suppressed the publication of scientific data on the dangers of asbestos. Their stated reason was to avoid the "promotion of lawsuits" by their employees. This was not the last time the asbestos industry hid data. In the late '50s they withheld information on the links between asbestos and lung cancer. The asbestos industry is not alone. Rohm and Haas covered up

the cancer hazard from BCME for most of the '60s. The Manufacturing Chemists Association delayed release of information on vinyl chloride for nearly two years in the early '70s. Dow withheld data from the National Institute for Occupational Safety and Health (NIOSH) and the EPA for nearly a year on the induction of chromosomal abnormalities by benzene. The list could go on for pages.

Given such priorities on the part of industry and its medical allies (and their immense influence on government policy), it is clear how the crisis of industrial pollution reached its present state and why the war on cancer could not and did not succeed. Simply stated, an emphasis on control and prevention would re-





quire industries' investing in existing plants significant amounts of money for modifications that would not increase profitability. The "preferable" search for a cure could be financed by tax dollars, would subsidize the manufacturers of complex research equipment, and would produce significant and profitable spinoffs (especially for pharmaceutical houses). Furthermore, should a cure be found, industry could only benefit from its production and use (remember the swine flu panic?).

The presentation of 13 different cases would be unnecessary if it didn't serve to emphasize and, by implication, to prove the basic similarity of the cases. The consistent positions of different industries

against control or regulation of chemicals, whether on scientific or economic grounds, reflects a basic commonality of analysis and purpose which goes beyond the personal morals of specific individuals, no matter how important the offices they occupy. Personal morals cannot satisfactorily explain such consistencies; economics can. Top-level managements are responsible for the position their companies take on health and safety questions. Such decisions are dictated by the drive for profits. The fight does not become one of people versus people, as individuals, but one between different ideas and bases of economic power.

This leads quite naturally into the book's final section and the main

topic, the "politics of cancer." But instead of real political discussion and analysis, we are treated to a laundry list of the laws, agencies (governmental and otherwise), and individuals associated with the federal regulatory and research structure as well as with private interest groups.

Villians or Cogs

Focusing on agency chiefs, Epstein loses sight of how agencies fit into larger governmental policy. Administrators, while important to the general attitude and performance of an agency, are still cogs in a much larger policy-making machine. Epstein believes that individuals, by themselves, have the ability to make the system work. His solution to the problem of poorly run bioassays is to establish "neutral third parties" to insure quality. Federal regulatory agencies can be made to work if the right people head them.

The problem with this approach is that it is at best a short-term tactic aimed at the symptoms and not the sources of regulatory failure. Scientists are no more objective than anyone else in evaluating scientific problems that have economic and political ramifications. Isolated individuals in positions of power are subject to immense political and social pressures forcing them to support the status quo. The book is littered with examples of scientists who turn against regulation and controls as soon as they leave the government and go to work for industry. The only way to counter that kind of pressure is to build a broad-based movement independent of both industry and federal agencies instead of developing "various legal and other safeguards...to avoid or minimize potential abuses and conflicts of interest" as Epstein has proposed.

The contradictions in Epstein's analysis of people and governmental agencies lead to problems in his understanding of other areas. Com-

The Asbestos Papers

Epstein's chronology of the asbestos tragedy illustrates how he works his facts into cornerstones of a corrupt structure — what the British medical journal *Lancet* calls the "Medical-Industrial Complex."

The following information emerged only as recently as October 1978 at hearings of the Subcommittee on Compensation, Health and Safety of the House Committee on Education and Welfare in San Francisco. Dubbed the Asbestos "Pentagon Papers," industry documents dating from 1933-1945 include correspondence similar to the following examples among senior executives, lawyers, doctors, consultants, and insurance companies of asbestos companies. These companies allege that they were not aware of the hazards of asbestos until 1964.

Epstein's documentation of the asbestos story begins in 1929, when Anthony Lanza, a scientific researcher, began a study of 126 workers with 3 or more years' experience working with asbestos. In 1931 Lanza completed his study, which was sponsored by two asbestos companies and Metropolitan Life Insurance, carrier for both companies.

On September 25, 1935, the editor of the trade journal *Asbestos* requested permission of the president of an asbestos company to publish a British article on the hazards of asbestos, saying discussion of it "along the right lines" might combat undesirable publicity given it in the newspapers. On October 1, 1935, the president wrote to Vandiver

Brown of Johns-Manville, still the world's largest asbestos producer, praising *Asbestos* for not reprinting the English articles, saying "the less said about asbestos the better off we are." He added that it would be better to publish an American study, i.e. Lanza's, which could be made more favorable to asbestos manufacture.

In 1935 Lanza's study results were published, after being edited by its sponsors (and censors), the asbestos and insurance companies. The published version portrays asbestosis as a disease milder than silicosis, in view of pending workmen's compensation legislation in New Jersey. The plant owners and medical insurers did not want asbestosis included as a compensable disease.

Prior to Lanza's manipulated study being published, Brown forwarded suggestions that "all favorable aspects of the study be included and that none of the unfavorable be unintentionally pictured in darker tones than the comments justify." Lanza, concluding in his published report that asbestosis was milder than silicosis, neglected to mention his findings that 67 of the 126 workers (53%) he examined suffered from asbestosis, which is in fact at least as debilitating as silicosis.

Kenneth W. Smith, medical director of a Johns-Manville plant in Canada, found seven workers with asbestosis but decided *not* to tell them. He advised to wait until the workers were totally disabled and then to make the diagnosis

and submit a claim *by the company*. Smith admitted that "the fibrosis of this disease is irreversible and permanent."

Where has government been during all this suppression and distortion of asbestos dangers? On April 26, 1978, then Health, Education and Welfare Secretary Joseph Califano said that as many as half of all workers exposed to asbestos since the beginning of World War II — between eight and eleven million workers — could develop serious diseases such as lung cancer, mesotheliomas and asbestosis. He urged these workers to get chest x-rays. He sent a letter regarding asbestos dangers to the country's 400,000 doctors. What Califano did not tell the workers about was their right to sue the government, nor were plans announced for a surveillance program, nor was any mention made of the National Institute for Occupational Safety and Health (NIOSH) recommendation that a 100,000 fiber standard was the only meaningful way to protect against asbestosis and other asbestos-induced cancers and diseases. Also, no mention was made of dangers of the public-at-large living close to asbestos plants, or of public exposure due to asbestos-containing consumer products. Epstein concludes that Califano's statement, though seriously lacking in some aspects, "opens the door of national health care policies to preventive medicine" because the high cost of surveillance of groups at high risk of cancer will encourage the "discovery" that prevention is cheaper than cure.

paratively little space is devoted to labor unions and their role in the fight, even though unions are the only existing vehicle for organizing workers. Further, workers in organized industries hold a significant weapon — the ability to withhold their labor. He also criticizes industry for "failing to understand the magnitude of health and safety problems entailed in the manufacture and handling of hazardous,

particularly toxic or carcinogenic, chemicals" and management for failing "to be aware of the shortcomings in its own modes of developing health and safety information..." and making "all-but-irreversible economic commitments...on the basis of information *that subsequently proves to be defective* or based solely on short-term marketing considerations." (Emphasis added.) Epstein's liberal

belief in the power of individuals blinds him to the realities of capitalism. Given the present economic system, industry has no choice but to base investment and production schedules on profit margins. Whatever good intentions individuals in industry might have are outweighed by larger economic concerns.

Epstein evidently denies that the basic problem is the nature and priorities of capitalism. He underesti-

Where has the scientific community been through all this? One example is the current Occupational Safety and Health Administration (OSHA) standard for asbestos-workers' exposure — an average of two million fibers per cubic meter of air over an eight-hour working day. There is a definite problem with this standard. Current optical microscopic techniques for counting fibers in the workplace can only detect fibers longer than 5 microns. Smaller fibers can only be counted by electron microscopy and they may outnumber the longer ones by as much as 100:1. Also, the shorter fibers are believed to be more carcinogenic than the longer fibers. Epstein urges development of a practical, sensitive method for monitoring total asbestos fibers in air breathed by exposed workers. The OSHA standard, inadequate as it is, was fought by industry, though it only addressed asbestosis and not cancer. This standard was later shown by U.S. investigators (Epstein doesn't say who) to be inadequate even for asbestosis, not to mention lung and other cancers.

The asbestos industry threatened employee lay-offs and cried severe economic dislocation. Despite this, organized labor fought for the OSHA standard, noting that asbestos is a major health hazard not only for asbestos workers but for workers in many other chemical and manufacturing industries where asbestos is used in many forms. Over the past decade, the asbestos industry has fought work health and safety regulation with lies and scientific manipulation. They have, over the last decade, funded major scientific studies, all of which minimized asbestos dangers. One of the studies, done by J. Corbett McDonald, then in the Department

of Epidemiology/Public Health at McGill University in Montreal, was presented in testimony at an OSHA hearing. McDonald introduced himself as a fulltime employee of McGill, and as an independent researcher. However, at the end of the text McDonald read from, in small print, was the acknowledgement: "This work was undertaken with the assistance of a grant from the Institute of Occupational and Environmental Health of the Quebec Asbestos Mining Association." In the face of mounting criticism, McDonald resigned his position at McGill, taking his asbestos-cancer research funds with him (including continuing support from the National Cancer Institute in this country). He went back to England, where he was appointed to the Trade Union Congress Chair of Occupational Medicine by the London School of Hygiene and Tropical Medicine.

Another example of the duplicity of key figures in the medical-scientific-industrial complex is Dr. Paul Kotin who, in 1942, was medical director and senior vice-president of Johns-Manville, the world's largest asbestos manufacturer. As such, he was a strong supporter of minimizing asbestos hazards. Contrarily, in 1970, as director of the national Institute of Environmental Health Sciences at Research Triangle Park in North Carolina, Kotin supported the opposite view on the dangers of asbestos. This is an example of what Epstein calls the "revolving door" policy between government agencies and private industry's leadership positions, where loyalty seems to supercede consistency and honesty.

As of now, OSHA's two million fibers per cubic meter of air standard still stands, 20 times in excess of NIOSH recommendations. And industry con-

tinues to fight to loosen OSHA standards: in 1972, the R.T. Vanderbilt Co., which owns talc mines in upstate New York and Vermont, put pressure on key congressmen for help. (Vanderbilt's talc has a high asbestos content.) The politicians obliged by pressuring then OSHA chief John Stender, who in turn pressured OSHA standards director Gerald Scannell. Scannell, over the objections of his own health standards chief, encouraged Vanderbilt to do its own sampling to determine if their talc contained asbestos, and advise Vanderbilt customers of their results. Vanderbilt rose to the opportunity by redefining their product so as to exclude its classification as asbestos, though it is clearly defined as such in the legal standards. Vanderbilt then notified their customers that "our talc products used in your manufacturing processes are not subject to the OSHA asbestos standard."

On July 4, 1974, an OSHA inspector cited a Vanderbilt customer, Borg-Warner, for violating the OSHA asbestos standard. The case went to the highest arbiter of OSHA cases, the OSHA Review Commission. On June 28, 1976, Judge Jerry W. Mitchell ruled against the company. Since then, a NIOSH epidemiological investigation of workers at Vanderbilt mines found "both respiratory diseases and lung cancers which appear to be significantly above those expected." Incredibly, rather than divert some profit into research and development for worker health and safety, industry continues to use more and more convoluted tactics to avoid responsibility. They say it's smoking and not asbestos that gives workers lung cancer, in spite of a 1977 NIOSH study that proves that non-smoking asbestos workers also have excessive risks of lung cancer.

—Beth Powers

mates the amount of pressure necessary to force the system to move because he does not explain why the system behaves the way it does. He apparently believes that a hierarchy of organizations and personalities in responsible positions, i.e. good bureaucrats instead of bad, can make the government deal effectively with the problem of cancer prevention and carcinogen control. Nowhere does Epstein give us a clue as to how

he believes that method of organization can hope to gather enough political and economic power to change the situation on other than a minor and temporary basis.

Despite such political failings, *The Politics of Cancer* is an impressive book. It contains all the necessary information — sufficient for scientists, political activists, or working people — to make an independent analysis. It has opened the

door to political solutions of what many would like us to think are purely medical or scientific problems. Finally, it points out the need for reliable information which can be used to convince people of the problems. Only when people start seeing environmental problems linked to health linked to industry linked to economic problems will they begin to look behind the facade and see the true face of the enemy. □

*The doctors said as they took their fees
There is no cure for this disease*
—Traditional folk song

THE POLITICS OF CANCER RESEARCH

by John Valentine

Detroit's new Radiation Oncology Center is a \$5 million project within the new Detroit Medical Center, a single massive institution designed to cover most of that region's health needs. The center will have its own \$4 million neutron therapy center for treating cancer, complete with a miniature cyclotron. Such a strategy is reminiscent of curing war with hydrogen bombs. The alternative to dealing with cancer after it has begun is the series of regular warnings from the government to avoid certain cancer-causing chemicals that are around everyone. Only sporadically are some of those chemicals removed from the industrial or retail market. This reinforces the popular emphasis on preventing cancer by controlling diet and "lifestyle."

The possible courses of action to deal with cancer often conflict. We can exert government control over diet and environment, but these regulations are met with protests about lost jobs, compromised freedom, or impossible enforcement — or with risk assessments stating that the problems are balanced by the benefit to society. Throughout this debate, the results of a huge amount of research seem to have very little certitude. It is almost never heard that "X causes cancer of the Y. So that's that. Take it off the market." We almost never hear, either, that "a simple cure is around the corner so don't worry."

Why is the question of cancer causation answered by little more than subterfuge and trends? Why is the research so uncertain? Why does prevention seem to be completely a matter of individual choice yet often impossible in spite of individual acts of will? For example, how is it that only recently has asbestos been publicly linked to lung cancer, when the association between asbestos and cancer was so obvious medically by 1918 that insurance companies stopped selling policies to asbestos workers in the U.S. and Canada(1)?

Cancer research in this country has become a bureaucracy and an industry, and certain avenues of research languish because of this. Cancer *prevention* and its research are not in the interests of the medical

establishment, and cause contradictions in our economic system. This article will examine the broad issue of cancer research: it includes analogies to past improvements in public health, a description of research fund distribution, some political analysis, and some discussion of action.

Theories About Cancer

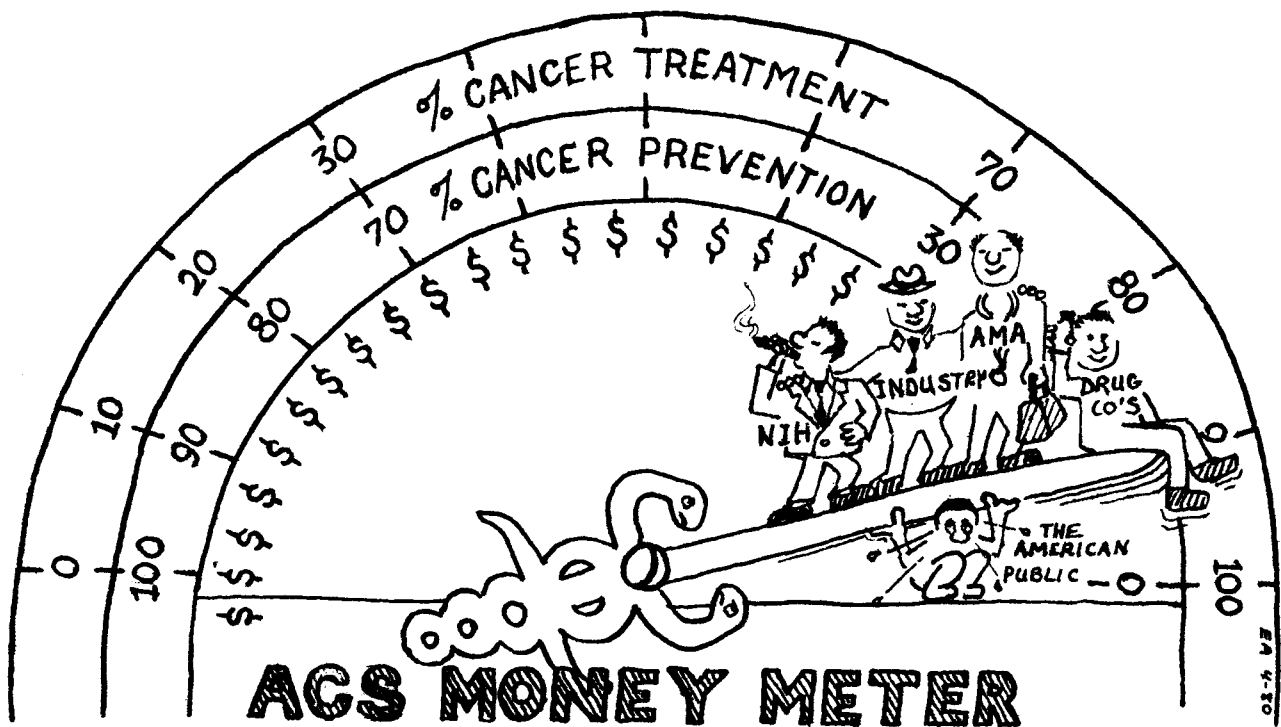
Two theories describe the origin of cancer (carcinogenesis). A viral theory argues that an infectious agent or native ubiquitous viruses trigger cell growth abnormalities. An environmental theory says that cancer is the result of chemical or other alteration (mutation) of the genetic material, DNA. Functioning as a physiological regulator, DNA is constantly active. If several regulatory genes are mutated and no longer contain the information they once did, loss of control over cell growth can occur, says the environmental theory. These are not mutually exclusive theories; variations often include parts of both. It is important to note that though the two theories may be only different approaches to the same process of carcinogenesis, they imply very different courses of action, and research is clearly split between the different approaches.

The Viral Emphasis

The viral theory allows us to view cancer as a communicable disease that attacks the population indiscriminately. It is popular with the medical research establishment. The study of a viral mechanism is amenable to investigation by existing techniques in molecular biology and implies the possibility of a universal vaccine

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Ellen Armstrong



to prevent cancer. However, viruses seem to be implicated in only a few cancers, and even then external environmental triggers seem to have a role in viral carcinogenesis. Also, the cancers (i.e., presumptive viruses) spread in a familial pattern rather than across populations, unlike common infectious diseases. In certain rodent cell cultures viruses will "transform" (make cancerous) the cells. However, Lewis Siminovitch, a pioneer of mammalian cell culture genetics said that, "transforming human cells is difficult. Transforming rodent cells is as easy as falling off of a log!" Most experimentation is done on rodent cells. Another example of research putting the cart before the horse is the observation by Siminovitch that "(practically) 99 percent of the work on humans is done on fibroblasts (a type of cell) and 1 percent on epithelial cells, while the incidence of cancer is 99 percent epithelial and 1 percent fibroblastic." Fibroblasts are studied because they are "easier to work with."

The Environmental Emphasis

The environmental theory or emphasis on cancer engenders public health solutions to cancer. The analogy of cancer prevention to previous reductions of health problems illuminates contradictions in cancer research.

It has been estimated that most of our improved health in the last century is due to improved sanitation and nutrition — public health measures. According to one study, 69 percent of decreased mortality over this period is due to reduction of eleven infectious diseases(3). Diseases treated with specific medical measures (such as polio) account for 3 percent of the reduc-

tion in mortality. About 97 percent of the reduction is attributed to "standard of living" improvements. The exponential rise in medical costs and treatment began only after 90 percent of the decline in mortality had occurred.

A more specific parallel between cancer and past health improvements is that with antibiotics. The size, shape, cost and limited accessibility of cancer treatment ("cure") can already be seen by analogy to the administration of antibiotics. The future of cancer treatment would seem to be refinement of techniques, development of drugs and therapeutic compounds, and increasing dependence on a particular industrialized technology, if the chemotherapeutic-surgical approach to treatment and research is further pursued. There is no question that antibiotics are an invaluable tool, but their use is misunderstood. It is unlikely that cancer would be cured in a single simple step by a new "miracle cure," just as treatment is almost never simple with antibiotics, the old "miracle cure."

The use of antibiotics in "hard cases" where they are really needed requires screening of the infectious agent to find out to what drugs it might be resistant. That requires the service of the medical-industrial complex. The hospital performs expensive tests; the drug and chemical companies develop drugs, tests, and equipment. Similarly, clinical cancer treatment researchers already predict that it will be necessary to biopsy each tumor and culture it. The laboratory then will have to perform drug resistance tests.

It should be noted that just as antibiotics are invaluable in saving lives, so is cancer treatment. There will always be cancer victims — just as no matter how clean and healthy we are, some people still get infectious dis-

eases. The important question overlooked by this approach is what role and capacity certain strategies have in the total picture of improving society's health.

It should also be added that an understanding of primary causation (who gets cancer and where) rather than mechanisms of action of environmental agents, has historical precedent. Social study of disease preceded biochemical understanding. For example, good nutrition has an accepted role in good health, even though the functions of many necessary nutrients are still unclear.

Historical precedent and technical arguments make a strong case for a focus by research institutions on environmental studies and the ecology of carcinogens and people, rather than on the viral and molecular process of carcinogenesis. Why has this not occurred? Is it a matter of inertia? A conflict of interests? Economic stakes? A reflection of a particular social and economic system?

Institutions

The institutions that control research and legislation must be examined if an understanding of the politics of cancer research is to be reached. There are institutions that distribute research funds at the national level, such as the governmental National Institute of Health (NIH) and its subordinate National Cancer Institute (NCI), as well as the private American Cancer Society (ACS). At the local level are the universities and private societies such as the Michigan Cancer Foundation (MCF). Both levels should be analyzed.

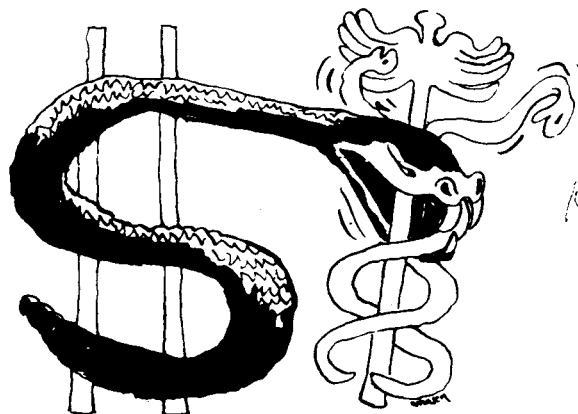
National Institutions

The NIH provided \$2.5 billion out of \$6.1 billion spent on cancer research in the U.S. by 1978. Nearly \$1 billion went toward cancer research via the NCI (4). Some non-NCI work is related to cancer. These institutions control much of the money, have political power, and virtually regulate the direction of research (by posing the questions and using easily influenced peer groups for review). Yet despite pressure from Congress and the U.S. Dept. of Agriculture, "officials at the NIH are skeptical It would be better, they say, to tell the public nothing rather than to call for a radical change . . . that might prove useless" (5). This describes an attitude about health in general and about initiating, executing, and acting on research. Is such research funding and public policy a matter of intentionality or are "all the data not yet in?"

Such a philosophy would seem intentional. Alfred Harper, Chairman of the Food and Nutrition Board of the National Academy of Science, stated that many epidemic killer diseases in this country are due merely to increased age of the general population(6). Senator

George McGovern chaired the Senate Select Subcommittee on Nutrition in 1976. In January of 1977, the subcommittee held a press conference to announce a proposal to merely advise Americans about dietary and environmental causes of the "killer diseases." Because of this, McGovern was shortly thereafter transferred to the Agriculture Committee and his powers as a select committee member were ended(7,8).

Sidney Wolf, Director of the Public Citizen's Health Research Group, testified before the Senate Subcommittee on Health and Science Research concerning the National Cancer Program (NCP). He spoke of the former director of chemical carcinogenesis research at the NCI Fort Dietrich Laboratory. He was, "one of the leading cancer researchers in the country who, without previous notice, lost his job . . ." He was replaced by, "a researcher in the area of viral carcinogenesis, and I think this was also demoralizing to people who see this as an ascendancy again of an area which has borne far less fruitful results in terms of understanding what causes cancer in humans than chemical carcinogenesis"(9).



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Much NCI money goes to the American Cancer Society, a private foundation which has a powerful influence on NCI and a well funded lobby(10). The ACS is a leader of the cancer treatment lobby. In the last decade it has "fought against or withheld support from every single critical piece of legislative action designed to regulate chemical carcinogens in the environment, such as toxic substances legislation, the Clean Air Act, and the Safe Drinking Water Act"(11). Also at the NCP hearings it was testified that the ACS has "interlocking relationships with NCI decisionmakers, with industry, and with investment bankers, who are still constraining and distorting policies away from developing higher priorities on cancer prevention activities in the NCI"(12). The chairman of the National Cancer Panel of ACS, Benno Schmidt, has made it explicit that he is "rather disinterested in cancer prevention."

Benjamin Byrd, past president and current cochairperson of ACS, responded at the same session of the NCP hearings by saying that, "Excellent care of cancer patients is more the rule than the exception today," and "NCI is not a regulatory agency and should not be. Establishment of comprehensive cancer centers (i.e., hospitals) was one of the most important aspects of the National Cancer Act"(13). The bias of the NCI reflects a tight association with the ACS. The interlocking between NCI and ACS is so tight that current NCI director, John Upton, issued a memo of "very strict rules that should apply to the interaction" between the two institutions. The memo has seven points calling for board examination of ACS requests for support rather than the usual automatic granting of funds(14).

State and Regional Institutions

Most NCI funds go to treatment programs and related institutions. (A plurality of funds, 35 percent, go to "profit-making institutions"(15).) One such institution is the Michigan Cancer Foundation (MCF). The MCF received \$6.2 million, as much federal funding as the combined support of the two largest state universities in Michigan in 1978, which was \$6.3 million(16). In an interview with Joy Harsen, head of Health Education (public relations) at MCF, it was established that there were several branches of operations, including breast cancer detection, several cancer patient field services, immunology research, human virus containment, and a chemical carcinogenesis unit. This latter unit, however, "takes no advisory action of its own but relies on FDA decisions." The chemical carcinogenesis program "collaborates with industry, labor, and local government" and has an advisory panel of the same elements. A breakdown of funding sources and allocations for the MCF was explicitly refused during two interviews, despite \$6 million in public funds involved.

The Cancer Screening Project is a part of Cancer Action Now, a field service funded mostly by ACS (money from federal NIH grant NOI-CN-65252 but administered by MCF) and run by the Detroit Health Department. Cathy Courtney, Health Educator, gave details of the attitude prevalent in the actual execution of the cancer project in an interview at the Health Department.

Much of the educational "outreach" funded by NCI is actually fundraising for MCF. Many of the programs provide jobs for job's sake and so change or action is difficult. There is widespread "institutional resistance to admission of environmental causation." Examples given were well-established cases such as DES, Agent Orange, the Pill, PCBP, and asbestos. Courtney spoke of minimal preventative measures which could be employed in education by Cancer Action

Now, such as HEW Secretary Joseph Califano's six dietary points, but the program supervisor "takes the attitude of, 'no, don't tell them that stuff, just go get tumors.'" The whole unit is motivated to report as many tumors as possible.



Political Conflict

Clearly, at all levels of funding and control by federal and private institutions, there is an aversion to studies of environmental causes of cancer. When such studies are done, little action is taken. It would be difficult to defend this inaction by saying "the data aren't all in," because we balk about even collecting data about our environment. It is easy to say that doctors occupy positions throughout these institutions, so they decide matters in a self-interested way. It is more insightful to look deeper into the social and economic fabric of the system that supports our medical system and its cancer research.

The ideas that govern research have a material social basis(17). The material factors that contribute to the treatment-oriented medical research establishment are the previously mentioned historical trends, the investments of drug companies (whose tremendous influence on the medical schools and hospitals has been documented elsewhere (18,19)), the cart-before-the-horse bias of available technology on research interests, and the interlocking of private interests and business practices with the decision-making bodies of public welfare organizations such as the NCI. Without hard financial backing and without intellectual "nourishment," some ideas (such as prevention) will certainly languish. Certain other formulations of the cancer problem will receive support, by no accident.

In David Ozonoff's analysis of the political economy of cancer research, he quotes a researcher speaking about the mechanistic approach to cancer: "'Although the removal of the carcinogen from the environment is obviously the most effective way to conquer cancer, it may require such a rearrangement of the environment that society cannot or will not allow this to be done except slowly over decades. A knowledge of the steps in the carcinogen process will almost certainly lead to ways to interrupt the process in the continuing presence of the carcinogen'"(20). Ozonoff continues: "In this context, 'rearrangement of the environment' is another way to say interfering with the economic and social structure, while the 'society' that objects is, of course, the small group of people known as the U.S. ruling class."

A political analysis of cancer research must also involve a look at cancer amongst Blacks. When considering cancer in Blacks it must be borne in mind that Blacks have no physiological propensity for cancer, but that their numbers are predominantly working class, urban, poor, and with health care less adequate than the better-off classes.

At the Senate National Cancer Program hearings, extensive data about Black cancer demography was provided. In the past 25 years the overall cancer incidence rate for Blacks went up 8 percent while the rate dropped 3 percent for whites. During the same period cancer mortality increased 26 percent for Blacks, 5 percent for whites. From 1949 until 1967, the yearly mortality increase was twice as high for Blacks as for whites. Another study cited showed that from 1950 to 1967, mortality increased 20 percent for Blacks and about 0 percent for whites. Some explanations that have been suggested are "poor screening and educational programs, diagnosis of cancer at more advanced stages, less timely or delayed treatment, and higher environmental risks"(22). The implied solution is vast expansion of the current medical-industrial complex. In fact it was stated in the conclusion of the NPC presentation that, "cancer management is so difficult and time-consuming that the already overloaded and understaffed facilities for medical care of Black patients may be put under a severe strain by an increase of Black cancer patients." It was further concluded that the only way to stem the exponential increase of Black cancer is to study environmental influences.

The affluent class in this society benefits most from a treatment oriented attack on cancer, since cancer rates are highest among the poorer groups such as workers and Blacks. To treat rather than prevent cancers would make most sense to the lowest incidence group. Treatment would make the most sense to those who could count on the best treatment. Thus, there is a contradiction between ignoring our present political and economic system and endeavoring to prevent cancer.

Research and Action

Much emphasis has been placed on dietary and lifestyle changes as the most important preventative measures against cancer and ill health. "There is a growing realization that lifestyle plays an important role in the ecology of disease. If there is a health crisis in America today, it is largely a crisis of lifestyle in which destructive habits such as alcohol use, drug addiction, lack of exercise, malnutrition, overeating, cigarette smoking, careless driving, and sexual promiscuity create health problems"(23). Put more bluntly, "cancer occurs because of something we do — we eat certain foods, we drink, we smoke, we choose a certain way to live"(24). In this admonition, the victim is blamed for cancer resulting from her or his "lifestyle." (Imagine telling the tubercular child laborers in Chicago, in Upton Sinclair's "The Jungle," that their problem was diet and then giving them six points of "wise nutrition"!)

Do-it-yourself health prevention is expensive, reaches only the best educated, meets intense competition with a system which predominantly markets the "bad" lifestyle, and is difficult to figure out. Though much is now known about diet and environmental risks, one needs a graduate medical education to understand what is now presented to the public. Misinformation is widespread, much to the benefit of the food and health industries. An example of the industrial-academic nexus is the academic journal *Nutrition Reviews*. It is a "legitimate" research journal put out by the Nutrition Foundation dedicated to "advancement of nutrition knowledge and to its effective application in improving the health and welfare of mankind"(25). Its board of trustees includes directors, vice-presidents, etc., from Stauffer Chemical Company; Specialty Chemical Group, Inc.; Hoffman-LaRoche, Inc; Life-Savers, Inc.; Revere Sugar Co.; The Coca-Cola Company; Oscar Meyer and Co.; The Nestle Company, Inc.; U.S. Dept. of Health, Education, and Welfare; Libby, McNeill, and Libby; Monell Chemical Sense Center; Miles Laboratories; and Dow Chemical Company.

There are truths about dietary prevention of cancer that are derived from research efforts. Rather than ignore them, it is useful to consider the nature of our food sources. Most of the food bought by the American public in supermarkets is a chemical-industrial product — refined, processed, transported, and marketed so as to yield higher profits. This attitude toward food (and toward our environment and much of the hardware that surrounds us) allows "lifestyle" to be lumped more easily under the broader category of industrial-chemical environmental "insults," which must be more extensively included in our research programs if cancer is to be effectively battled. In other words, our food and objects around us should be considered just more environmental chemicals.



John Valentine

Testing for Carcinogens

There is a great deal of confusion surrounding the testing of chemicals (occupational insults, food, petrochemicals, etc.) for carcinogenicity. Part of the problem has already been discussed; only 1 percent of the NCI budget goes into testing, and the documentation-registry program is neglected. Much of the controversy and ambiguity could be eliminated by testing and epidemiological follow-up.

There are some 70,000 chemicals currently in industrial use and about 700 new ones are added each year, it is widely acknowledged. Even if only a few of these are carcinogenic, a serious health hazard is present. Thus far, assays have correlated well with epidemiological studies to the extent that all of the chemicals showing carcinogenicity in animal tests show some correlation with human epidemiological studies when such human data are available (26).

In addition to testing, it might be decided that certain chemicals are not needed after their cost to society is considered. "Many classes of chemicals are known to be more likely carcinogens than others. Sulphuric acid and other basic industrial ingredients are simple inorganic compounds which are not likely to be carcinogens. Most of the carcinogenic ones are, in fact, chemicals that have been introduced recently as replacements for perfectly satisfactory materials that have been used for generations, even for millenia. Many of these

carcinogens, in fact, have been introduced just for profit. The majority of byproducts of petroleum refining and plastics manufacturing, by the nature of their chemical structures, are likely to be carcinogenic. But uses are sought for them just the same" (27).

For those chemicals deemed necessary, testing should be easy. Testing would be exhaustive if even 1 percent of the \$100 billion cost of cancer to society (28) were not externalized (excluded) from corporate profit calculations. The cost of testing each of the 700 new chemicals each year is \$200,000. The total, \$140 million, is .4 percent of the gross profits of the chemical industry in 1976(29). The costs are trivial. If the expected rise of cancer incidence in the early 1980s occurs, "trivial" will barely describe the cost ratio between testing carcinogens and the cost to society of cancer. (At the time that this article was being prepared, two easily understandable evaluations of the cancer problem were published that consider externalized costs and corporate hindrance of the solution(30,31).)

Despite the obvious benefits of accurate chemical testing, the NCI bioassay subcontracts continue to be awarded to industrially-owned testing facilities(32)! The few doctors and researchers who are sympathetic to fundamental change in attitude toward cancer research testify endlessly but produce few results. HEW and the FDA are repeatedly paralyzed and hesitant to act because of outside influences. Legislation affecting our "sea of carcinogens" is lobbied out of existence, often by groups like the American Medical Association (AMA), ACS, or MCF, in conjunction with industry.

So, rather than the data not all being in yet, we are not researching the fundamental ecology between people and the chemical environment. When we do act, great impediments arise from non-scientific and economic forces such as business interests, the medical-industrial lobby, and the ideology of a nonrepresentative capitalist ruling class. The major solution to cancer — social planning — has little to do with present cancer research.

The entire social environment(33) should be considered so that the very need for the existence of certain industries and chemicals could be an overall consideration in cancer research. It might be shown empirically that good health is inconsistent with a system that allows private companies to externalize from their responsibilities the effects of their processes and products on society. "A framework for clinical investigation that links disease directly to the structure of capitalism is likely to face indifference or active discouragement from the state"(34), so an approach to researching cancer goes far beyond simple debate of technical points within the medical-academic arena. The research must be politicized at the laboratory and institutional levels and must include social and economic considerations.

To politicize cancer research will surely challenge the institutions and ideology of capitalist health care practice. □

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NOTES FOR ACTIVISTS

continued from page 7

If we sincerely want to control cancer, we must address all these issues. I suggest that a broad political perspective can incorporate all the different strategies that should be pursued to control cancer.

Conclusions

Cancer is just one piece of a much broader problem. Activists must understand this, and understand some of the complexities of the disease as well. The "pollution causes cancer/chemicals are bad" line is faulty and may do more harm than good. Because this *has* been the line, attacks like Monsanto's "Without chemicals, life itself would be impossible" campaign can be effective. Of course there are "good" chemicals, both synthetic and natural. Of course there are "bad" natural products. Neither of these points should deflect campaigns to stop pollution, but they can if activists use an overly simplistic approach.

Synthetic chemicals and atomic radiation of human origin represent additional mutagenic (hence carcinogenic and teratogenic) risks on top of those from natural sources. They must be controlled and, as far as possible, eliminated. Many synthetic chemicals benefit only the corporations who sell them to replace a natural substance which once did the same job — the rest of us share the *costs* to our health from those chemicals and their manufacture.

People must understand that their risk of getting cancer is partly determined by other people's decisions which they can only affect through political activity, and partly by their own actions — how they eat, whether they smoke, etc. Both of these directions can be pursued simultaneously — they need not be antagonistic. □

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A Ton of Cure

WHY THERE IS NO CANCER PREVENTION

by Carol Horowitz

The prevention of many cancers is a simple matter that seems to be completely ignored by the medical community. Medical science now knows the causes of many cancers. Prevention only requires removing these causes from the environment. What is not simple is the impact that this would have on the powerful forces in the U.S. economy.

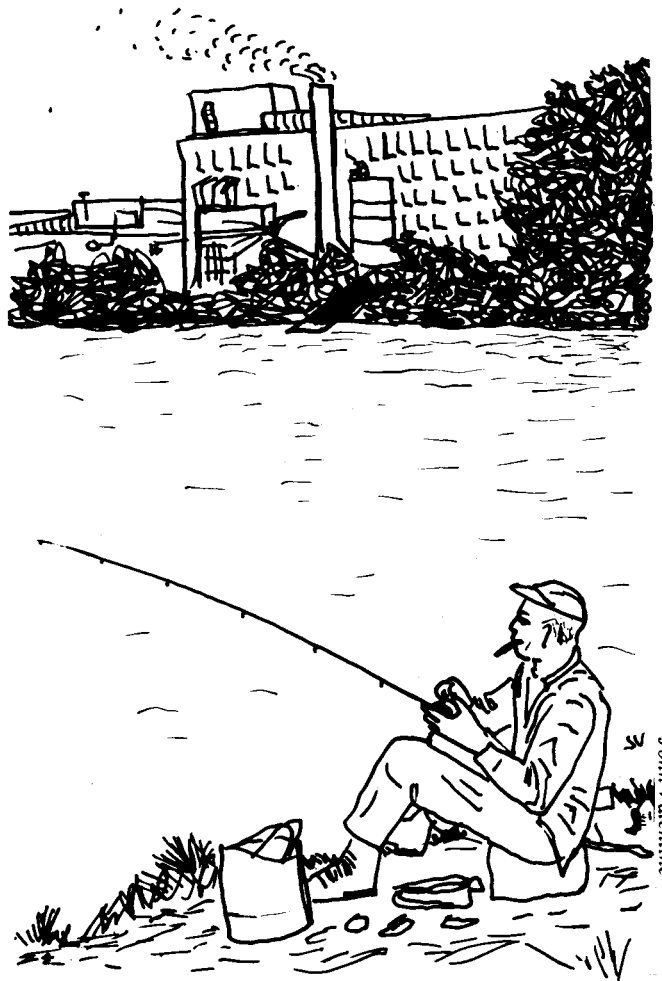
Example: Smoking

The most obvious example of this analysis is the prevention of lung cancer. The American Cancer Society has issued a statement on cancer prevention which claims that "an estimated 118,000 deaths a year could have been prevented if people hadn't smoked." Lung cancer is the number one cause of cancer deaths in men and is rapidly increasing in women. There are more than 100,000 new lung cancer cases every year. Lung cancer has one of the lowest survival rates of any cancer; present ten-year survival rates are 5 percent with conventional therapies.

Some lung cancer is caused by occupational exposure, but smoking combined with occupational exposure is a truly deadly duo. Fifty percent of all uranium miners die of lung cancer, and workers exposed to chromate get lung cancer 40 times more often than the average person.

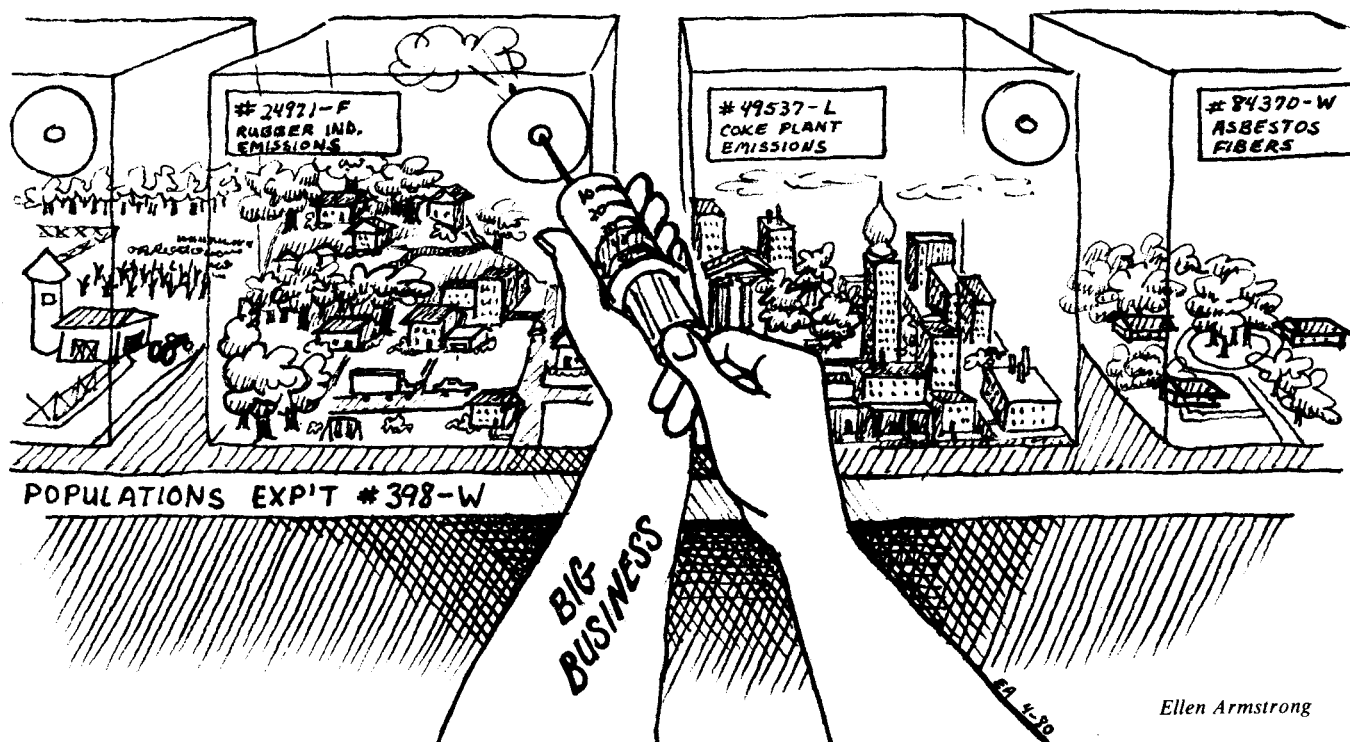
Why do people smoke even though its dangers are so well known? A paper published by the Public Citizens' Health Research Group(1) puts the answer to this question in an interesting economic perspective. Millions of dollars are spent by the tobacco companies every year to convince people that smoking is sexy, liberating, and something that very healthy "outdoors" people do. Every year the industry spends more than \$2,857 per lung cancer death to encourage people to smoke. The federal government gives price supports to

tobacco farmers that amount to nearly \$1,000 per person dying of lung cancer. These price supports to the tobacco industry are presently more than \$60 million every year. In contrast to this spending which promotes cigarette smoking, the federal government spends only \$14.30 per lung cancer death on education about the hazards of smoking.



Carol Horowitz is a public health consultant living in New Mexico. Her specialties are environmental health and occupational cancers.

~ THE GREAT CANCER EXPERIMENT ~



Ellen Armstrong

After the 1964 Surgeon General's report on the hazards of smoking, many people quit smoking or reduced the number of cigarettes they smoked. The number of men who smoke is on the decrease. Yet, the number of women smokers is rapidly increasing. In the past ten years many "feminine" cigarettes and advertising campaigns have been designed to encourage women to smoke. The success of this expenditure is mirrored in the increase of lung cancer and lung cancer deaths among women.

It is important to remember that even though the tobacco farmers get government agricultural subsidies, it is the multinational tobacco corporations who reap the real economic benefit from smoking. George Weissman, chairman of Philip Morris, shows how corporate profit is more important than health. He says, "We never let the Surgeon General panic us into losing faith in cigarettes." Phillip Morris "found that cigarette making could be far more profitable in new factories with computerized quality control"(2).

Example: Occupational Cancers

Another example of preventable cancers is the category of occupational cancers. It is not fair that the worker is forced to choose between having a job and having health. The National Institute for Occupational Health and Safety released a report in October 1976 which documents occupational hazards as a cause of cancer. The report states that 390,000 American work-

ers suffer new cases of occupational disease every year, and that 100,000 eventually die (4). Dr. Irving Selikoff, one of the most respected authorities on the environmental cancers, described why so many cancers first show up in the workplace:

Since workers are first exposed and most heavily exposed, the workers give us the first indication. Most things that cause cancer in society are discovered in the workplace. We would still have vinyl chloride in cans of aerosol hair spray if it hadn't been for cases of angiosarcoma (a rare liver cancer) in chemical workers. There would still be asbestos in do-it-yourself wallboard taping compounds, such as Spackle, if it were not for cancer in asbestos factories. We would still use benzene in many cleaning compounds if it were not for leukemia in rubber and other workers(5).

Workers are the guinea pigs of America. Chemicals are used without adequate testing until deaths of workers prove the dangers. Many times job hazards would be greatly reduced by installing adequate ventilation systems, adequately clean working conditions, and disposable workclothes. These seem very simple to implement, but to a management only concerned with profit, they are too expensive. The government and industry endlessly debate what level of exposure to a carcinogen is safe, while workers continue to die.

Cancer Research and Prevention

There is a computerized cancer literature file called CANLIT. This file lists more than 65,000 articles and abstracts about the various aspects of cancer. There are 500 computer terminals in the U.S. where it is possible to plug into this data bank. I went to one of the terminals looking for information on cancer prevention. I programmed the computer to retrieve articles with *prevention* appearing in the title. Of the 65,000 articles, 1369 has the work *prevention* in the title. However, when the titles began to print out it was obvious that "prevention" was not enough of a key word; many of the titles were about the prevention of side effects of various cancer treatments and did not fit into my definition of cancer prevention. The librarian and I then decided to ask specifically for titles with the words "cancer prevention" in the title. This reduced the number of titles to only 171. We then printed out the first 93 of these to see what types of information were represented.

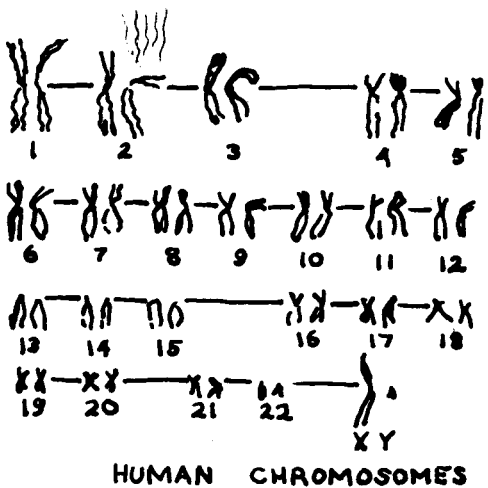
These 93 titles are the primary research on cancer prevention for the years 1976-1979, the other 78 were prior to 1976 so I didn't print them. Of these 93, only 20 fit into the definition of cancer prevention that I was searching. Out of 65,000 articles in the CANLIT, I was able to locate 20 that were about prevention of cancer through the identification of carcinogens in our lives. Interestingly, of these 20 article, half were from foreign journals, the results of studies done in other countries.

To learn what exactly was going on in the labs of America, I went to the three-volume *Research Awards Index 1978* published by the Department of Health Education and Welfare (DHEW). I took a survey of where cancer grants are going. I found close to 25,500 grants under the main heading "Neoplasms" (tumors). Of the 25,500 grants, only 150 were under the heading "Neoplasms — Prevention and Control." Relatively few studies are being done on the known causes of cancer. Of these none are discussing how to prevent them. Examples of research into known causes are neoplasms, radiation-induced, 60 studies; nutrition-induced or dependent, 110; hormone-induced or dependent, 400; environment-induced, 210; drug-induced, 33. This shows, more than any other information I found, the total lack of interest in cancer prevention by the medical and scientific establishment. If DHEW states in its own publications that 70-90 percent of all cancers are environmentally caused, how can they justify 210 grants out of 25,500 to study the area of environmentally induced cancers!

**Cut, Burn, and Poison —
Cancer Therapies Causing Cancer**

Radiation and chemicals, two of the main causes of cancer, have emerged as two of the main treatments of cancer. This has come about as the result of a large-scale publicity campaign by the medical industrial complex. At a conference on breast cancer on April 8, 1978, I learned a great deal about the disease and the standard treatment of it. One workshop was entitled "Treatment Alternatives," which turned out to be very different from what I had expected. The alternatives referred to were radiation and chemotherapy, presented as alternatives to radical breast surgery!

I asked the doctors leading the workshop, a radiologist and a chemotherapy specialist, how these two causes of cancer had ended up as treatment. Much to my surprise I was told that they are not considered cures of cancer. They said that the patient makes a trade-off — killing cancer in one site now for potential of whole body cancer ten years later. Chemotherapy is known to cause lymphoma (cancer of the lymphatic system) and radiation is a cause of leukemia. Five year survival from cancer is considered a cure. Because of this short-range



John Valentine JV

view, when another cancer is contracted more than five years later, it is considered a separate case.

At this same conference I asked a surgeon what types of prevention were being considered for breast cancer. The surgeon answered my question by saying that the way to prevent breast cancer was the surgical removal of both breasts before cancer develops, primarily for high-risk women. He then continued to describe the three operations which complete this "preventive" technique. First both breasts are removed. A second operation implants silicone to make "new" breasts, and a third operation stitches nipples on the breasts. This is definitely a profitable method of cancer prevention. The methods of breast reconstruction were developed for women who had to have their breasts removed to treat their cancers. It is a sick irony to adapt this into a type of prevention. It is similar to the many gynecologists who encourage women to have hysterectomies to prevent uterine cancer. There is a proven correlation between fat in the diet and cancers of the sexual organs.* It seems far better to educate people to change their diets to prevent cancer than to have surgery as a preventive technique.

In addition it has recently been learned that the cancer patient who has been treated with radionuclides remains highly radioactive after treatment. This means that the hospital staff is dangerously exposed, as is the family on the patient's arrival home. Two articles in the March 1978 *Journal of the American Public Health Association*, "Population Exposures from Radionuclides in Medicine — As Low as Reasonably Achievable?" and "Contamination of the Home Environment by Patients Treated with Iodine 131: Initial Results," document the ways this cancer cure may cause more cancer than it cures.

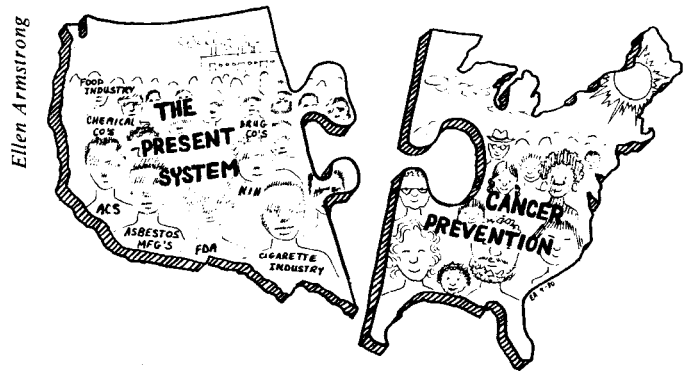
All in all, of the \$20,000 every cancer case generates, most of the money goes to the three "therapies" of cut, burn, and poison — and the hospitalization expenses that accompany them.

Political Action — The Only Real Cancer Prevention

Some leftist political analysts looking at the 1980s believe that the movement to stop nuclear power will be the most important mass movement of the new decade. There is no doubt that the anti-nuke movement will become an ever increasing movement, but in reality, it is inseparable from the movement to stop cancer.

Periodicals as different as *Mother Jones* and *Fortune* have stated recently that the real political issue is cancer. In a *Fortune* article on carcinogens in diesel exhaust (9), Charles Burck said, "Cancer from man-made (sic) chemicals — so-called environmental cancer

*Personal communication from Larry Callan, ex-director of New Mexico Cancer Control.



— has come in recent years to rival, if not replace, nuclear holocaust as the major specter of technology gone amok."

Joe Klein states this same opinion in *Mother Jones* in his article "Are They Just Full of Granola?"(10). He says of Three Mile Island that "of course, there are now thousands of people in Pennsylvania who live with the awful fear that they, or, especially, their children will get cancer courtesy of the ineptitude of Metropolitan Edison and who knows what other industrial felons. I suspect, as *In These Times* suggested last year, that cancer may be the real issue."

I have always believed that the issue for the 1980's is cancer. My professional experience in public health has been work in a National Cancer Institute-funded state Cancer Control Program Prevention Unit and work in an occupational health program. I have been part of the blossoming cancer bureaucracy assigned to tasks that do nothing to lessen the epidemic. This has helped me understand that preventing cancer is a political task, not a medical one.

There is much more profit in finding a cure for cancer than in preventing the disease. Industry tries to manipulate cancer prevention into a case of the environmentalists against the workers; just as nuclear power, uranium mining, automobile emissions standards, and too many others have been previously manipulated. But this time, with cancer, there is a new factor that the governmental medical industrial complex has not figured — the cancer victims themselves.

One group of cancer victims has already begun to fight in an organized way. These are the DES daughters. These young women are now getting cancer because their mothers were prescribed the hormone diethylstilbestrol (DES) when they were pregnant. These women have organized a national movement to inform other

women exposed to DES in the womb to help guarantee that they have regular examinations and receive the earliest possible treatment if they contract cancer.

DES daughters are involved in several law suits against the drug companies that produced DES and sold it to pregnant women even after it had been proven ineffective for the medical conditions for which it was prescribed. Young women today are still being prescribed DES as a morning-after pill with disregard for its dangers. And only this year has DES finally been banned for use as a growth stimulant in cattle and poultry production, so most meat-eaters have unknowingly been eating this dangerous hormone for many years.

Women are angry about being given cancer for industrial profit and are fighting back.

DES Verdict

In the nation's finest verdict ever in favor of a DES victim, a six-member jury of three women and three men awarded \$500,000 to Joyce Bichler, a 25-year-old Network member who developed vaginal cancer 18 years after her mother took DES to prevent miscarriage. The verdict went against Eli Lilly Company, the country's major producer and promoter of DES.

During the six-week trial, Joyce Bichler told the jurors how she had to have an extensive cancer operation at Albert Einstein Hospital leaving her with no uterus, no lymph glands, one ovary, and only one-third of her vagina.

"I never went to court just for myself," said Bichler. "I wanted to show that the drug companies just can't do this to us. They can't use us as guinea pigs."

... Early in the trial, representatives from the National Women's Health Network, New York N.O.W., HealthRight, and DESAction-New York demonstrated outside the courthouse in solidarity with Ms. Bichler.

—Quoted from *National Women's Health Network News*, September/October 1979.

Women and the Crisis in Sex Hormones by Barbara and Gilbert Seaman(11) gives excellent documentation of the cancer epidemic for both men and women. The chapter "Promise her anything . . . but give her cancer" sums up the authors' well-researched conclusion about the economic benefits of the cancer epidemic. It says, "Cancer is good for the economy too. There is a grim joke that 'more people live off of cancer than die from it'. The total care of a terminal cancer patient averages \$20,000. Cancer provides lots of jobs for medical workers and morticians." At this rate, the low estimate of 70,000 new lung cancer cases every year introduces a

billion and a half dollars into the medical economy. The total national cancer expense becomes overwhelming when looked at in these terms.

Conclusion

It is up to us to see that cancer becomes a national political issue. This does not mean allowing the government to continue pouring tremendous amounts of money into the search for a vaccine or a genetic cause of cancer or into dangerous and short-term treatments in the name of conquering cancer. This fooled people before. We must demand that cancer prevention take its place as one of the most important issues facing us as a nation. No doubt our lifestyles will be simplified as we learn to do without elements that now seem an integral part of our lives.

Most of the dangerous carcinogens proliferated in the short span of years since World War II. Preventing cancer does not mean a return to the dark ages. If the miracles of technology that occurred in the past 35 years were directed to the development of a non-environmentally-destructive civilization powered by the sun, wind and tides, cancer would retreat to its prior position as an obscure and rare disease.□

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ADDITIONAL RESOURCES

- New Age*, special issue on "Curing Cancer, Demystifying the Disease of our Times," July 1978.
- New York Academy of Sciences, *Cancer and the Worker*, New York, 1977.

resources

SCIENCE FOR THE PEOPLE ARTICLES

(Available from SftP, 897 Main St., Cambridge, MA 02139.)

"Epidemic — The Cancer Producing Society," *Science for the People*, July/Aug. 1976. A SftP presentation at the 1976 AAAS meeting. It establishes that the incidence of cancer is increasing, discusses obstacles to reducing human cancer, and counters several specific myths about cancer.

"A Marxist View of Medical Care," Howard Waitzkin, *SftP*, Nov./Dec. 1978 (special issue on health care). A thorough examination of medical ideology and a political analysis of how our economic system begets a particular type of health care.

"Society May be Dangerous to Your Health," Fran Conrad, *SftP*, March/April 1979. Establishes that your health is more a result of societal influences and practices than you think — certainly true in the case of cancer.

OTHER ARTICLES

"The Cancer Establishment," Ralph W. Moss, *The Progressive*, Feb. 1980. The connection between large corpora-

tions, government, and the medical establishment stops action against cancer — particularly preventative action.

"The Political Economy of Cancer Research," David Ozonoff, *Science and Nature*, No. 2(1979). A short statement of the political crisis, rather than the medical crisis, in cancer research. (Available from Hymann R. Cohen, Secretary, Dialectics Workshop, 130 St. Edward, Brooklyn, N.Y. 11201.)

"Cancer, Inflation, and the Failure to Regulate," Samuel S. Epstein, *Technology Review*, Dec./Jan. 1980. A detailed economic analysis of the high societal cost of cancer, the cost of prevention, and corporate resistance to testing for carcinogens and compliance with regulations.

GENERAL WORKS

The Politics of Cancer, Samuel S. Epstein, (Sierra Club Books) 1978. Epstein first explains the cancer problem, looks at about a dozen examples of attempts to regulate and investigate carcinogens, and finally discusses the politics of cancer in terms of inadequacies of government and private policies. Reviewed in this issue.

THE ANSWER

Who says that cancer will be eliminated? The Union Fidelity Life Insurance Company sent out an advertisement for cancer insurance. It terrorizes the potential customer with the admonition that, "The same happened to these famous people (pictured) . . . it could happen to you!" We can do nothing to avoid cancer, although, "Cancer can be cured. But specialized cancer treatment can be extremely costly. The late Senator Hubert H. Humphrey, himself a Cancer Victim, warned that, 'Only a few millionaires can afford Cancer.'" If you apply for your Cancer Benefit Policy by the deadline date, you get a free Cancer Fact Pack. Our problems are solved.

National Cancer Program, 1979, Hearings before the Subcommittee on Health and Scientific Research of the Committee on Labor and Human Resources — United States Senate on March 5 and 7, 1979 titled "Examination of the Cancer Program on its accomplishments to date, where it has succeeded, where it has fallen short of expectations, and why." A goldmine of data, testimony, and short presentations about the medical-industrial establishment and government. Available for free from Senator Kennedy's office, Senate Office Building, Washington D.C.

BACKGROUND RESOURCES

"The Cancer Problem," *Scientific American*, 233(5), 1975, and **"Genotoxicity,"** *Coevolution Quarterly*, Spring 1979, are two easily understandable articles on cancer itself. They go into some detail but are not overly technical. The former article discusses the clinical and demographic elements of cancer as well as causes, while the latter article also explores how carcinogenicity is measured.

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NEWS NOTES

(continued from page 2)

— among Breckenridge residents." In Muskegon, the cancer rate for lung cancer is 44 percent higher than elsewhere. Air and water pollution from chemical concerns are suspect. Trichloroethylene has been found in the Ann Arbor, Dundee, Holland, Detroit, and Traverse City water supplies. This is thought to be a result of chlorine interacting with chemical pollutants. Dioxin is in everything near Midland, where Dow Chemical is situated. The list goes on. Are Michigan residents an endangered species? And how about your water supply?

Chapters and Contacts

Science for the People is an organization of people involved or interested in science and technology-related issues, whose activities are directed at: 1) exposing the class control of science and technology, 2) organizing campaigns which criticize, challenge and propose alternatives to the present uses of science and technology, and 3) developing a political strategy by which people in the technical strata can ally with other progressive forces in society. SftP opposes the ideologies of sexism, racism, elitism and their practice, and holds an anti-imperialist world-view. Membership in SftP is defined as subscribing to the magazine and/or actively participating in local SftP activities.

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