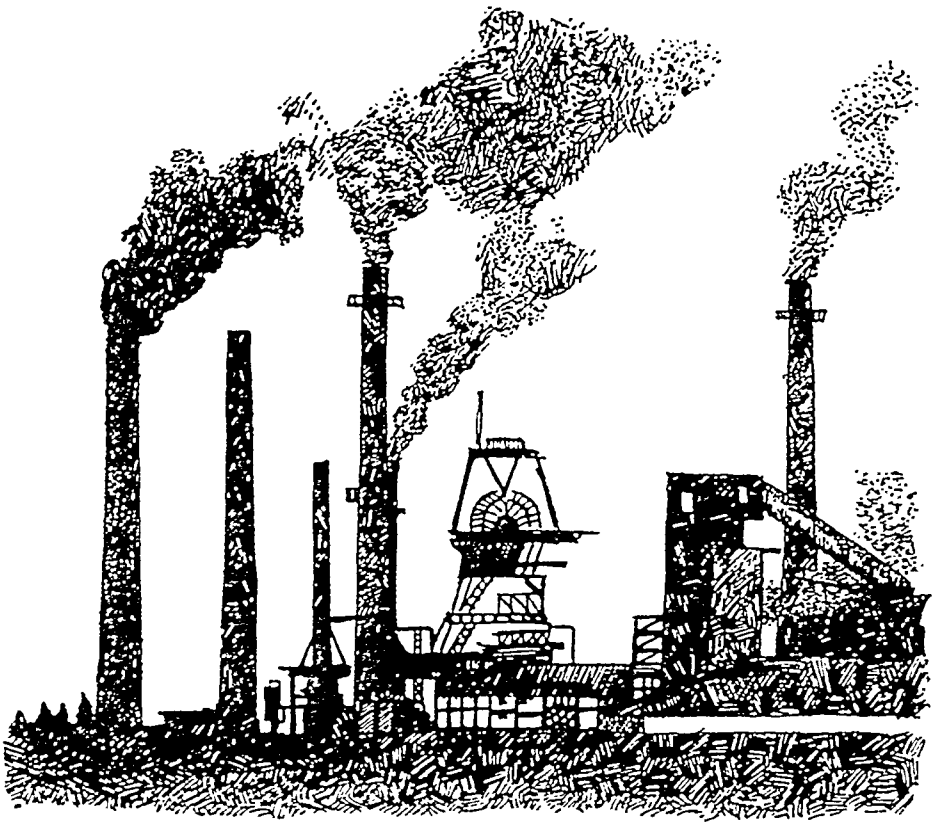
jurisdiction. Plant opponents argue that the plants' close proximity should allow CES to consider the two plants as a whole when assessing the air pollution impacts. GWF would then be forced to provide additional offsets to compensate for the plants' combined emissions.

If the Board of Supervisors, in ruling on GWF's appeal, agrees with GWF's prediction of PG&E's increased energy demand by the early 1990s and accepts the GWF's EIR as adequate, opponents say they will file suit to challenge the plan. They believe that absent a convincing showing of need, why should GWF further pollute San Joaquin Valley's air, which currently fails to meet federal air quality standards?

EDITOR'S NOTE: *In January 1989, the Fresno County Board of Supervisors postponed its decision regarding GWF's power plant proposal pending further studies. The Board of Supervisors will make a final decision sometime in November 1989.*

Nicole Lance is a first year student at King Hall. She would like to pursue a career in environmental law.



© Pete McDonnell From "RE:SOURCES"

Food Irradiation: A Snag In the Seamless Web

by Leslie K. Bolin and Gail Stidham

INTRODUCTION

On April 18, 1986, the Food and Drug Administration (FDA) published regulations permitting broad use of food irradiation, including, for the first time, fresh fruits and vegetables. 51 Fed. Reg. 13,376 (April 18, 1986). These controversial new regulations have garnered support from a curious alliance: the food processing industry and the Department of Energy (DOE). Food processors see food irradiation as a potential multi-billion dollar industry. The DOE sees food irradiation as a means to rid itself of large amounts of nuclear wastes generated by nuclear

weapons and the nuclear power industry. The two groups tout food irradiation as a method of food preservation and deinfestation and as a substitute for toxic agricultural chemicals and pesticides.

Food irradiation promoters envision hundreds of irradiation facilities across the nation within the next ten to twenty years, concentrated in prime food-producing regions and near population centers. For example, according to one projection, the food irradiation industry will construct seventy three food irradiation plants in Fresno County, California alone. M. Mayell, *Zapping Your Daily Diet*, E. W. J., Feb. 1986, at 36, 43. From 1985 through 1988, Congress granted the DOE $5 million annually, primarily for the development of six demonstration food irradiation plants. *Id.*

These figures, particularly the sheer number of projected irradiation facilities, raise serious environmental concerns. Yet neither the FDA nor any other agency prepared an environmental impact statement prior to the April 1986 regulations' approval. The FDA's approval of these regulations gives a green light to food irradiation promoters. Citizen action and consumer resistance may be the only means to prevent further implementation of this expensive, capital-intensive technology fraught with environmental dangers.

THE IRRADIATION PROCESS

The food irradiation process exposes food to high levels of ionizing radiation. Cesium-137 or Cobalt-60, both lethal wastes of the nuclear industry, provide the necessary radioactive source in the form of rods. The irradiation plants store the radioactive rods in pools of water. Food then moves through an enclosed irradiation chamber on conveyor belts, and a mechanism raises the rods from the water, exposing the food to the radiation. Exposure to radiation measuring between 5,000 and 3,000,000 rads, depending on the food type, alters food cells and kills insects and microorganisms. (A rad equals one unit of energy absorbed from ionizing radiation.) In contrast, the typical x-ray exposes a person to approximately one rad of radiation.

The food irradiation process involves enormous amounts of radiactive material. Most proposed food irradiation facilities would handle one to ten million curies of Cesium-137 or Cobalt-60. (A curie measures one unit of radioactivity.) In contrast, radiation therapy used for cancer treatment requires only 3,500 to 10,000 curies of radioactive isotope. 133 Cong. Rec. E399-01 (Feb. 4, 1987) (statement of Rep. Bosco). The DOE does not have sufficient Cesium-137 to supply all potential irradiation facilities. Therefore, the DOE proposes to develop spent fuel reprocessing technology to compensate for the cesium shortage. Department of Energy, The Food Irradiation Program (brochure included in National Coalition to Stop Food Irradiation, Information Manual I (1987)). Incidentally, cesium production creates weapons-grade plutonium as a byproduct.

EXISTING USES

The number of existing irradiation plants constitutes a fraction of the number of projected plants. Currently, approximately forty irradiation plants operate in the United States. These existing plants primarily sterilize medical equipment and supplies, packaging materials, and plastics, and investors could easily convert the plants into food irradiation plants. Prior to the April 1986 regulations, the FDA approved the use of irradiation on wheat, potatoes, and pork, for limited purposes, and on spices. Little or no commercial application followed this approval, however, apparently because the food processing industry considered the technique unprofitable. Yet as the FDA authorizes more foods for irradiation, the process will probably become more commercially profitable. In fact, the FDA is currently considering approval of irradiation of poultry products.

HEALTH & SAFETY ISSUES

Considerable debate surrounds the issue of whether irradiated food poses a danger to human health. Experts agree that irradiated food is not radioactive. (This only holds true, however, so long as no contaminated water splashes on the food during the irradiation process.) Yet a number of studies have shown adverse effects such as vitamin depletion and creation of radiolytic products (a chemical change) in irradiated food, indicating at least a need for further studies. Other studies have indicated carcinogenic responses from irradiated food consumption. Blume & Jacobson, *Food Irradiation: Is the Time Ripe?*, Nutrition Action Newsletter, Nov. 1986, at 1, 6. The FDA, however, disregarded these studies when declaring food irradiation safe.

OVERSTATED BENEFITS

Food irradiation proponents overstate the irradiation process's benefits. First, scientists question whether irradiation will extend food's shelf-life by any substantial length of time. Dr. Noel F. Sommer, Postharvest Pathologist, Department of Pomology, University of California, Davis, and his colleagues, under the auspices of the Atomic Energy Commission's Atoms for Peace program, conducted a ten year study on irradiation of fresh fruits and vegetables. Based on this and other research, Dr. Sommer concluded that "only a very short shelf-life extension resulted from irradiation.... Often no more than two to five days extension was observed."

Sommer & Mitchell, *Gamma Irradiation: A Quarantine Treatment for Fresh Fruits and Vegetables?*, 21 Hort. Sci. 356, 356-7 (June 1986). Dr. Sommer also concluded that "[a]ll too frequently, the shelf-life was significantly shortened, not extended, by the radiation treatment." *Id.* Further, food irradiation cannot substitute for the vast quantities of agricultural chemicals applied to growing crops. Irradiation also causes fresh produce to soften, which renders the produce more susceptible to injury during transportation and handling. Consumers may even find irradiated produce's taste and texture unacceptable.

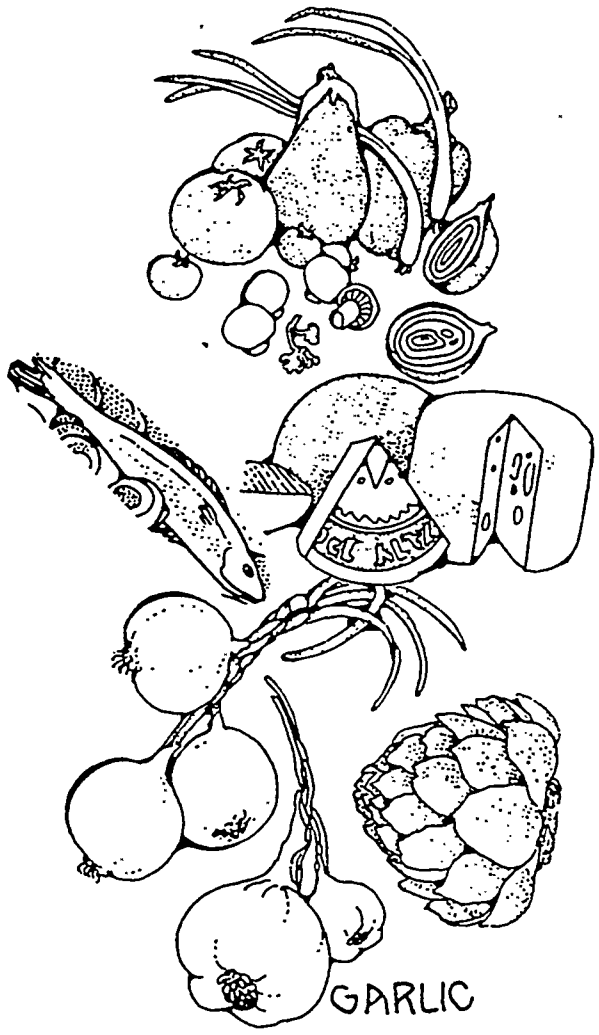
ENVIRONMENTAL SNAGS

The National Environmental Policy Act (NEPA) requires all federal agencies to prepare an environmental impact statement (EIS) for all "major federal actions significantly affecting the quality of the human environment." NEPA § 102(2)(C), 42 U.S.C. § 4332 (1982). The EIS requirement serves a two-fold purpose. First, the requirement ensures that agencies consider environmental factors via the EIS in their decison making process. Second, the EIS conveys relevant and valuable information to the public. Furthermore, NEPA requires agencies to prepare an EIS before they make any "irreversible and irretrievable commitments of resources." NEPA § 102(2)(C)(v), 42 U.S.C. § 4332 (1982). As a practical matter, however, once an agency spends substantial amounts of time and money on any alternative, it becomes difficult to change course to other alternatives, whether it constitutes an improvement or not.

Despite NEPA'S mandate, when the FDA approved the April 1986 regulations, it made a finding of no significant impact, and therefore, stated that NEPA required no EIS. 51 Fed. Reg. 13,376, 13,398 (April 18, 1986). The FDA casually dismissed environmental concerns regarding worker safety and transportation, handling and disposal of radioactive materials. The agency stated that existing Occupational Safety and Health Administration (OSHA), Nuclear Regulatory Commission (NRC), and Department of Transportation (DOT) regulations "are adequate to ensure that there will be no adverse environmental impact." 51 Fed. Reg. 13,376, 13,395 (April 18, 1986). The question remains unanswered whether these agencies have the resources, time, and staffing necessary to monitor one thousand food irradiation plants scattered across the country.

Historically, courts have seemed willing to lend tacit support to nuclear-related matters, often at the expense of the "human environment." The United States Supreme Court has granted particular deference to agency consideration, or lack thereof, of nuclear risks. This deference has created a "nuclear loophole" of sorts. In one such decision, the Court upheld an agency decision not to consider energy conservation as an alternative to construction of nuclear reactors in Michigan. *Vermont Yankee Nuclear Power Corp. v. Natural Resources Defense Council*, 435 U.S. 519, 555 (1978). In a later case, the Court held that the NRC complied with NEPA in failing to consider psychological health risks when the NRC decided to permit the restart of Three Mile Island Unit 1 after Unit 2's meltdown. *Metropolitan Edison Co. v. People Against Nuclear Energy*, 460 U.S. 766, 778-79 (1983). In yet another case, the Court held that NEPA did not require the U.S. Navy to prepare an EIS for a nuclear weapons storage facility in Hawaii because whether or not nuclear weapons were actually stored at the facility constituted classified information. The mere possibility of storage did not trigger the EIS requirement. *Weinberger v. Catholic Action of Hawaii/Peace Education Project*, 454 U.S. 139, 146 (1981). (For a criticism of this decision, see McCaull, *The NEPA "Nuclear Loophole": The Homeporting Saga of the U.S.S. Missouri,* Environs, July 1988, at 3.) Is this apparent "nuclear loophole" wide enough for food irradiation as well?

The FDA did not prepare an EIS to determine whether existing regulations covering transportation of radioactive materials will adequately prevent accidents. Rather, the FDA relied on a NRC analysis of radioactive matter transport. 51 Fed. Reg. 13,376, 13,395 (April 18,1986). The NRC concluded that its regulations would adequately protect the public against



"unreasonable risks." 46 Fed. Reg. 21,619 (April 13, 1981). But the NRC based its conclusions on a 1975 survey of radioactive materials shippers. Reliance on this report merely provides a false sense of security because in 1975 only a limited number of irradiation plants received radioactive materials. A full-scale food irradiation program would have many more trucks criss-crossing the country on interstate highways, transporting highly radioactive materials to irradiation facilities.

The FDA also asserted that OSHA regulations would sufficiently protect workers in irradiation plants. 51 Fed. Reg. 13,376, 13,395 (April 18, 1986). Yet serious employee accidents have taken place in the past. In the United States, at least two reported incidents involving workers accidentally exposed to near-lethal doses of radiation have occurred. 42 Fed. Reg. 57,572 (Nov. 3, 1977); Atomic Energy Commission, Press Release (June 14, 1974). Exposure also presumably killed a worker at a Norwegian irradiation plant in 1982. N.Y. Times, June 1, 1986, at F2, col. 1.

Indeed, existing irradiation facilities' safety records are far from perfect. Numerous accidents have occurred at irradiation plants. In June 1988, Cesium-137 capsules leaked into storage pools at a Radiation Sterilizers, Inc. plant in Georgia. According to the DOE, leakage from the "doubly encapsulated stainless steel" capsules was virtually impossible. The accident resulted in the appearance of radioactive contamination on employees' clothing, in employees' homes, and on medical products sterilized at the plant. *Broken Promises in Atlanta*, Food Irradiation Alert, Dec. 1988, at 1, 6.

Cleanup after an irradiation plant accident often proves difficult and expensive. After an accident involving cracked rods at a New Jersey irradiation plant, the cleanup crew dumped contaminated water down shower drains into the public sewer system. Apparently, cleanup crews commonly practice such methods of handling contaminated materials. DOE's "nuclear fuel processing center in Fernald, Ohio reportedly dumps 109 million gallons of highly radioactive waste into storm sewers illegally every year." Shulman, *More Pollution from the Pentagon*, Science For The People, Sept./Oct. 1988, at 5. In addition, the New Jersey accident's cleanup eventually cost more than the irradiation plant's original construction cost.

In June 1986, the NRC suspended Radiation Technology, Inc.'s (RTI) irradiation facility operating licenses. The NRC based the suspensions on findings that personnel frequently bypassed safety interlocks in violation of NRC requirements. The findings indicated that the violations were willful and that numerous management and operations personnel willfully provided false information to the NRC [so as to] demonstrate a pattern of wrongdoing so pervasive that the NRC no longer has reasonable assurance ... that the Licensee will comply with NRC requirements and that the public health and safety, including the safety of the Licensee's employees, will be protected if this Licensee is permitted to continue its irradiation activities. 51 Fed. Reg. 23,612 (June 30, 1986). Prosecutors recently convicted Martin Welt, RTI's former president and a major food irradiation promoter, for bypassing safety regulations and then trying to cover up his actions.

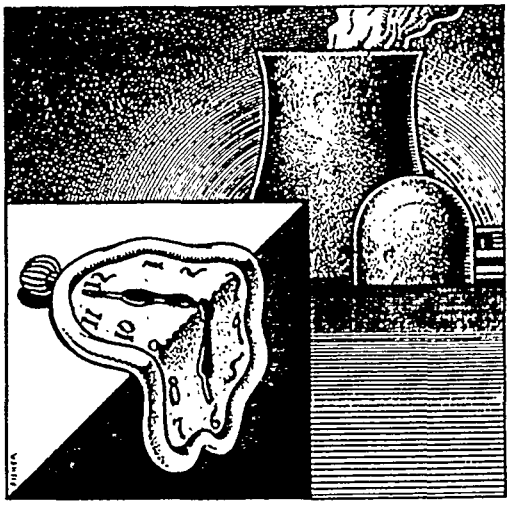
GROWING CITIZEN OPPOSITION

Food irradiation currently faces growing citizen opposition. Rep. Douglas H. Bosco introduced a bill in the U.S. House of Representatives (H.R. 956) to ban food irradiation expansion until experts can establish safety. Rep. Bosco expressed concern about the environmental and health risks, as well as the lack of need for the process. 133 Cong. Rec. E399-01 (Feb. 4, 1987) (statement of Rep. Bosco). The Senate must consider a similar bill (S. 461). Maine recently passed legislation prohibiting the sale of foods processed with radiation or foods containing irradiated ingredients. Me. Rev. Stat. Ann. tit. 22, §§ 2152, 2155 (1987). At least eight other states are considering similar legislation. At the local level, citizen groups concerned about radiation and drinking water contamination have organized to prevent construction of irradiation facilities in their communities.

THE SEAMLESS WEB

In a vacuum, several interest groups could conceivably see food irradiation as a beneficial technology. Industrial food processors stand to profit enormously from food irradiation. Food irradiation will also provide the DOE with a short-term solution to its radioactive waste problem. Dangerously short-sighted, however, these motives could lead to serious environmental consequences. The more transactions involving radioactive materials which occur, the greater the risk of environmental contamination.

Food irradiation is analogous to the current toxic chemicals situation. Decades of chemical use in industrialized countries has created serious environmental and health problems. Hazardous waste disposal problems continue to plague communities



© Mark S. Fisher

every year. Unanticipated, long-term health implications surface each day. Environmental policy analysts now call for source reduction -- reduction of both hazardous chemicals and their hazardous wastes -- as the best means to combat escalating environmental pollution. Thus, food irradiation takes us a step backward, and if unchecked, will serve to augment the escalating hazardous materials problems and their attendant health risks.

Substituting food irradiation for food petrochemicals and pesticides merely substitutes one inappropriate technology for another. Safe alternatives to food irradiation and chemicals do exist, and scientists can further develop these alternatives in the future. Given food irradiation's inherent dangers and the industry's blemished safety record, a widespread food irradiation program seems simply absurd.

Leslie K. Bolin is a second year student at King Hall. She presently serves as the Environmental Law Society's Treasurer, and therefore, manages all fundraising efforts for ENVIRONS. Leslie received a B.A. in French Language and Literature from Northern Illinois University and has done graduate studies in political science and ecology at Arizonia State University. Gail Stidham is a first year student at King Hall.

Mono Lake Symposium

Mono Lake Update

by Kathy Smith

INTRODUCTION

Now nearing its tenth year, litigation over water appropriation in the Mono Basin began in 1979 when the Audubon Society and several other environmental groups sought to enjoin the City of Los Angeles's water diversions from Mono Lake tributaries. Since that time, the parties have filed numerous lawsuits, and yet, Mono Lake's future is still in doubt. This year, several major events have occurred, adding to the controversy over the lake's future. First, a scientific study conducted for the state legislature and a U.S. Forest Service draft management plan both reported that Mono Lake's condition will deteriorate if the lake's water line drops below its current measurement of 6,377 feet above sea level. Secondly, the United States Court of Appeals, Ninth Circuit remanded the original 1979 Audubon case back to California state court. Finally, the California Court of Appeals ruled that the California State Water Resources Control Board (SWRCB) should revoke the City of Los Angeles's current water permits involving the Mono Basin and should reissue them with provisions to protect downstream fisheries. This continuing and complex legal battle over California water use pits natural resource preservation against economic growth and development.

THE MONO LAKE BASIN AND LOS ANGELES

Mono Lake lies nestled against the snow-capped Sierras, with Yosemite National Park to the west and the Nevada border to the east. Although the lake receives most of its waters from snowmelt, due to its lack of natural outflow, the lake contains naturally saline water. Part of an ancient ecosystem estimated at least 750,000 years old, the area's unique environment supports brine shrimp and brine flies. These species in turn feed large populations of California gulls, eared grebes, Wilson's phalaropes, and other birds. For these and other reasons, Mono Lake constitutes a scenic and ecological treasure of national significance.

The City of Los Angeles lies south of Mono Lake, with a large population and a great need for water. Early this century, Los Angeles viewed the Mono Basin merely as an area where fresh water flowed into a salty sink and evaporated. To Los Angeles, the Mono Basin constituted tapable water resources. In 1920, Los Angeles began purchasing riparian water rights in the Mono Basin, and in 1940, the Division of Water Resources (predecessor to the SWRCB) granted the Los Angeles Department of Water and Power's (DWP) application to appropriate the entire flow of four out of the five streams feeding Mono Lake. In 1941, the state granted an operating license to DWP, and the first waters were diverted from Mono Lake tributaries into the Los Angeles aqueduct system. In 1970, Los Angeles completed a second aqueduct and Mono Basin water diversions increased approximately fifty percent, totaling an average of 100,000 acre feet per year. (One acre/foot equals the amount of water necessary to cover one acre of land with one foot of water.)

In 1976, a group of college undergraduates received money from the National Science Foundation to study the Mono Lake environment. Their observations on the effects of the lake's declining