

02/18/2006

Enclosed are excerpts
from a very timely
resource pertaining
to "special exposure issues"

rec'd 2/21/06

whether the injury was self-inflicted or whether a loss of hearing was total and permanent, must be in writing. An appeal must be submitted by a member or a member's legal representative or by the beneficiary or the beneficiary's legal representative, within one year of the date of a denial of eligibility, to the office of the uniformed service identified in the decision regarding the member's eligibility for the benefit.

(2) An appeal regarding whether a member was insured under Servicemembers' Group Life Insurance when the traumatic injury was sustained must be in writing. An appeal must be submitted by a member or a member's legal representative or by the beneficiary or the beneficiary's legal representative within one year of the date of a denial of eligibility to the Office of Servicemembers' Group Life Insurance.

(3) Nothing in this section precludes a member from pursuing legal remedies under 38 U.S.C. 1975 and 38 CFR 9.13.

(i) Who will be paid the traumatic injury protection benefit? The injured member who suffered a scheduled loss will be paid the traumatic injury protection benefit in accordance with title 38 U.S.C. 1980A except under the following circumstances:

(1) If a member is legally incapacitated, the member's guardian or attorney-in-fact will be paid the benefit on behalf of the member.

(2) If a member dies before payment is made, the beneficiary or beneficiaries who will be paid the benefit will be determined in accordance with 38 U.S.C. 1970(a).

(Authority: 38 U.S.C. 501(a) and 1980A)
[FR Doc. 05-24390 Filed 12-20-05; 10:53 am]

BILLING CODE 8320-01-P

DEPARTMENT OF HEALTH AND HUMAN SERVICES

42 CFR Part 83
RIN 0920-AA13

Procedures for Designating Classes of Employees as Members of the Special Exposure Cohort Under the Energy Employees Occupational Illness Compensation Program Act of 2000; Amendments; Interim Final Rule With Request for Comments

AGENCY: Department of Health and Human Services.

ACTION: Interim final rule with request for comments.

SUMMARY: The Department of Health and Human Services ("HHS") is amending

its procedures to consider designating classes of employees to be added to the Special Exposure Cohort under the Energy Employees Occupational Illness Compensation Program Act of 2000 ("EEOICPA"), 42 U.S.C. 7384-7385. HHS must change these procedures to implement amendments to EEOICPA enacted on October 28, 2004, as part of the Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005, Public Law 108-375 (codified as amended in scattered sections of 42 U.S.C.).

DATES: *Effective Date:* This interim final rule is effective December 22, 2005.

Comments: The Department invites written comments on the interim final rule from interested parties. Comments on the rule must be received by February 21, 2006.

ADDRESSES: Address written comments on the interim final rule to the National Institute for Occupational Safety and Health ("NIOSH") Docket Officer electronically by e-mail to NIOCINDOCKET@cdc.gov. See **SUPPLEMENTARY INFORMATION** for file formats and other information about electronic filing. Alternatively, submit printed comments to NIOSH Docket Office, Robert A. Taft Laboratories, MS-C34, 4676 Columbia Parkway, Cincinnati, OH 45226.

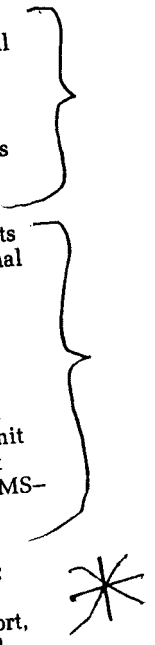
FOR FURTHER INFORMATION CONTACT: Larry Elliott, Director, Office of Compensation Analysis and Support, National Institute for Occupational Safety and Health, 4676 Columbia Parkway, MS-C-46, Cincinnati, OH 45226, Telephone 513-533-6800 (this is not a toll free number). Information requests can also be submitted by e-mail to OCAS@cdc.gov.

SUPPLEMENTARY INFORMATION:

I. Comments Invited

Interested persons or organizations are invited to participate in this rulemaking by submitting written views, arguments, recommendations, and data. Comments are invited on any topic related to the changes in the Special Exposure Cohort ("the Cohort") rule (42 CFR part 83) effectuated by this rulemaking. Comments concerning any other provisions of the Cohort rule, unchanged and unaffected by this rulemaking, will not be considered.

Comments should identify the author(s), return address, and phone number, in case clarification is needed. Comments can be submitted by e-mail to NIOCINDOCKET@cdc.gov. Comments submitted by e-mail may be provided as e-mail text or as a Word or



This engaging biography illuminates the achievements of the remarkable woman scientist who revolutionized the concept of radiation risk. For more than 40 years, Alice Stewart (born in 1906) warned that low-dose radiation is more dangerous than has been acknowledged. In the 1950s she began research that led to the discovery that fetal x-rays double a child's risk of developing cancer. Two decades later—when she was in her seventies—she again astounded the scientific world with a study showing that the U.S. nuclear weapons industry is about 20 times more dangerous than safety regulations permit. She has in recent years become one of a handful of independent scientists whose work is a lodestone to the anti-nuclear movement and was called “perhaps the Energy Department's most influential and feared scientific critic” by the *New York Times*.

“Gayle Greene's *The Woman Who Knew Too Much* seeks to trace Stewart's unconventional approach in investigating the effects of man-made radiation. It provides some shrewd insights into her personality and methodology.” —*The New York Times Book Review*

“Stewart's story is one of perseverance, ingenuity, compassion, independence, and integrity, a noble tale in the checkered history of science.” —*Booklist*

“A fascinating mixture of biography and oral history . . . Stewart's scientific passion, her feistiness, her political naivete and her wit shine in each chapter.” —*Women's Review of Books*

“This story of Dr. Alice Stewart, an audacious, insightful medical researcher, stands as a monument to the grit that allowed her to challenge tenets of mainstream scientific opinion.” —Steward Udall

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**The University of
Michigan Press**

ANN ARBOR www.press.umich.edu

ISBN 0-472-08783-5



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radiation the bombs gave off, reanalyses that call into question all further calculations.³²

"The RERF and the international standard-setters have underestimated the number of cancers produced by the bombs. They have underestimated radiation's other effects—genetic damage, immune system damage, lowered resistance to disease, infection, heart disease. These are serious misrepresentations because they suggest that it's safe to increase levels of background radiation.

"The approval of standards based on this skewed data is irresponsible and actually wicked."

The Standard-Setters

The International Commission on Radiation Protection (ICRP) came into existence in the late twenties, to review what was known about radiation and draw up guidelines by which workers and the public would be protected. It set permissible radiation doses of up to 75 rem a year for doctors and dentists and those working with radiation. By 1936, ICRP had reduced its recommended permissible doses for workers to 50 rem, then to 25 in 1948, to 15 in 1954—and to 5 in 1958. There the level has remained.³³

But "there is something disturbing about the repeated assurances, 'this time folks, we have got it right,' " comments Dr. Morris Greenberg, a senior public health official for the Health and Safety Commission in Britain, "when on each occasion, a previous understatement of hazard is revealed."³⁴

The ICRP has set a standard of five rem per annum exposure according to a risk-benefit principle that allows a one in five thousand chance of contracting cancer. The standard was proposed with full knowledge that there will be health injury and death to some, but it was decided that the overall societal benefits of atomic energy would outweigh damage to the few.

The five rem standard has been "plucked out of a hat," says Alice.

Who or what is the ICRP, that it has the power to make these decisions?

"I'm not sure it's an organization I would trust with my life," says Karl Morgan, one of its founders and a member for more than a quarter of a century. After the war, it came to consist mainly of physicists who worked on the Manhattan Project. Its members have associations with the military and with the medical radiological societies, all of which have

Records
Secrecy

Chapter 10

Rogue Scientists

"It smells, doesn't it? when those who are assessing the danger of the industry are in the pay of the industry. It's like the fox guarding the henhouse."

After the Mancuso affair the Department of Energy split the study of the workers' records into groups, assigning them to government contractors in Hanford, Oak Ridge, and Los Alamos. From now on, research on nuclear health was to be performed solely by labs under contract to the DOE.

"Divide and conquer—in this case, literally," says Alice. "The government determined never again to let the records fall into the hands of one person. And it determined not to allow any researchers from outside the DOE to have access—now only their own people could come anywhere near them. From now on, the research would be strictly in-house."

Mancuso's data on the Hanford workers were given over to Battelle-Pacific Northwest Laboratories, a major contractor at Hanford, located on the Hanford site—which meant that Hanford was now in the position of evaluating the health of its own employees. The study was put under the direction of Sidney Marks, formerly of the Energy Research and Development Administration (ERDA, formerly AEC, soon to be DOE)—the same Sidney Marks who had urged Mancuso to issue the press release contradicting Milham's findings and who by this time had left the federal agency to take a position with Battelle. (Battelle had been awarded \$80 million in government business by ERDA.) It happened that in transferring Mancuso's work to Battelle, federal officials violated the usual protocol: they failed to put the contract out for competitive bidding, to submit the contractor's past work or present capabilities to peer review, or to ask Battelle to submit a research design. It also happened that Battelle had never done a human epidemiological study before.¹

Mancuso's Oak Ridge data were assigned to Dr. Clarence Lushbaugh

at Oak Ridge Associated Universities. Lushbaugh had no one on staff with the expertise to handle the project; this assignment was made, again, without proper protocol.²

The data on the nuclear workers became the virtual monopoly of a small group of government-sponsored scientists and were made unavailable to the larger scientific community. Research on the nuclear workers now went on entirely without reference to the Mancuso/Stewart/Kneale findings, without reference to their caution about the healthy worker effect or the sensitive methods George Kneale was developing to measure exposure over time. "It's as though the MSK study never happened—except for the rebuttals that were flying about the world," comments Alice.

Behind the walls of secrecy, ERDA, then DOE carried on research without independent oversight, shielded from the open processes of scientific inquiry or public accountability. The agency had established a principle of state ownership of science. "Talk about the fox guarding the chicken coop," says Alice: "here you have the fox reporting on morbidity and mortality in the chicken coop."

Not surprisingly, this research turned up no cancer hazards for low-level radiation.³

State-Controlled Science

But the Mancuso affair had opened a Pandora's box, and try as the government might to put the lid back on, the scandal was attracting the attention of scientists throughout the world.

Dr. Joseph Rotblat, who would win the Nobel Peace Prize in 1995, wrote in the *Bulletin of Atomic Scientists* in 1979 that the Mancuso incident highlights the "contradictory objectives" of the AEC/ERDA/DOE, to promote nuclear energy and "prevent its misuse," and has ramifications "beyond the U.S. administrative arrangements, because similar situations (whereby the same body is given the task of protecting against the harmful effects of products it promotes itself) can be found all over the world."⁴ Dr. Karl Morgan sent a scathing letter to Secretary of Energy James Schlesinger: "One can only suppose that the new Oak Ridge team must get the *right* answer, i.e., prove there is *no* radiation risk to Hanford workers, if it cares to have a continuation of funding."⁵

The scandal raised an outcry from concerned citizens groups, workers, and unions demanding that Mancuso be allowed to continue his study. In a joint letter to the Secretary of Energy in November 1977, representatives of the Oil, Chemical and Atomic Workers Union and seven environmental organizations charged that the termination of Man-

Rogue Scientists

cuso's contract "reflects a well defined tradition of scientists who do not agree with the government's policy." The United Steelworkers Union, the International Union of Machinists and Aerospace Workers, and the American Public Health Association issued a statement to Joseph Califano, Secretary of Health, Education and Welfare, demanding that the DOE restore and research on the health of nuclear workers.⁶

"The suppression of scientific research happens in countries like the Soviet Union," says a spokesman for the Environmental Policy Institute, "but it is not happening right here."⁷

So began a struggle to wrest control of the DOE and put it under the auspices of a more independent agency that would succeed—though it is still in progress—research to the Department of Health.

From Silkwood to Stewart

It was the lobbying efforts of Bob Paul Rogers (Democrat, Florida) and the Environmental Policy Institute, a nonprofit organization in Washington, DC, and had become interested in the health of nuclear workers.

Alvarez had been drawn into the scandal by a serendipitous route: his wife, bringing a case against Kerr-McGee, Crescent, Oklahoma, on behalf of a young technician at Kerr-McGee plant, had approached AEC. The technician, Kerr-McGee was violating her contract to produce documentation; she was located in her apartment in Kerr-McGee, Oklahoma, on November 13, 1977, driving to meet with a labor union representative with the intention of reporting the violation. The Oklahoma highway patrol stopped her, though later investigation

were badly flawed. "It's high time they let in some fresh air. There are a lot of questions to be answered about the weapons complex facilities."²⁷

Her position was supported by *Dead Reckoning*, a 1992 review of 124 DOE epidemiological studies of nuclear workers, conducted by the Physicians for Social Responsibility. It found that the department had looked at only a fraction of the 600,000-person workforce and there had been major problems with the design and methodology of the few studies it had done. It found also that most DOE studies had neglected the healthy worker effect, which made it possible to come in with more cheerful risk assessments than warranted.

"And these are the epidemiological studies that have been the basis of DOE's endless assurances over the years that there's no evidence that anybody has been harmed, either in the workforce or in surrounding populations, by DOE weapons-producing activities," said Dr. Jack Geiger, one of the authors of the study. "All of this was occurring behind a virtually impenetrable wall of secrecy—none of it was subject to external scientific review." Geiger refers to "an ugly combination of monopoly and secrecy—secrecy with regard to access to the most useful kinds of basic data on the exposure of human populations to low-dose radiation and monopoly in which so many of the people in the field were funded by the agencies that were producing the hazards. Secrecy corrupts and absolute secrecy corrupts absolutely."²⁸

Dead Reckoning found that the DOE had discounted findings that might be alarming to the workers and the public and that the secrecy protecting its operations had allowed it to censor, intimidate, demote, and dismiss scientists whose discoveries were seen as harmful to DOE interests. It cited Mancuso as the primary, though by no means the only, instance.²⁹ It saw this pattern of denial and manipulation as part of the DOE's effort to minimize its liability for compensation and recommended that the DOE get out of the health research business.

Alice Gets Her Data

Finally, in 1990, under pressure of a Freedom of Information Act lawsuit and the threat of congressional legislation that would transfer epidemiological research to the Department of Health and Human Services, the DOE consented to transfer the workers' records to the Three Mile Island Public Health Fund.

The attempts at legislation had gone nowhere. Senator Timothy Wirth and Senator John Glenn had introduced bills in 1984, then again in



bogged down with unnecessary interference. I suppose there are a lot of people hoping we'll go away, or disappear, by shortage of money or by old age."

A further follow-up, a 1995 Hanford paper, once more corroborates the age effect.⁴⁰ "We're doing our best to convince the world about this important question—it's very crucial because whoever wins this battle will determine whether the A-bomb data are of value in assessing risk to workers and the public." She is gratified to see others validating her findings—including "some of the DOE's own people." Steve Wing, a University of North Carolina epidemiologist working under DOE contract, found a cancer effect in the Oak Ridge data and published his findings in March 1991; in a subsequent study, he corroborated the age effect—as we'll see in chapter 14.

Epidemiological studies need time, as Alice is fond of saying. They also need patience, and it helps, if you are an epidemiologist, to be long lived. But the Three Mile Island Fund that's supported her and George ran out in June 1996. "I may be a bit gloomy, but I'm very old, and time is running out."

Chapter 13

The Invisibiliz of Alice

*"The best way not to find
is not to look for it."*

There are a lot of people wis
findings imply that there are
around facilities, risks that are
at worst, financially ruinous.

The reason the nuclear in
that it is a clean, safe industry
beyond a shadow of a doubt t
actually been caused by wor
installations. Cancers don't c
period is long and variable, a
background radiation that bc
ous logic, it is left up to those
are the *least* likely to have
rather than to the multibillio
contaminant.

Alice and George have b
ful in establishing proof—if :

Do Nuclear Installations

Cancer clusters had been det
in the U.K. public inquirie
Point. All these facilities had
investigations confirmed tha
ronment, acknowledged tha
cess of what would be ex

would be difficult to ascribe; concluded that "participation not have a detectable effect their total risks of develop-

report in December 1993.²⁵ veterans, admitting that the e test veterans but attribut- cipation in the nuclear tests e nor on incidence of can- relatively high number of sing" and there may well iated with participation in en. "I do hope that partici- ring as we do," Doll said; ed to substantial risks as a ill be reassured."²⁶

ng. John Armstrong, secre- tion, said, "this is the very ; for this for ten years, and ncer!" Ken McGinley, a expressed disbelief: NRPB red independent, he said, t to lose if the study had

ice concludes, "there was oll and Darby, and—the e nothing—Tom Sorahan e data, how you read the r turning up in situations safe."

er

tion cases in the United In 1980-81, she was star ing radiation and cancer epartment of Energy. ept stretch between the a dismal safety record,

though there had been, as usual, no serious studies of workers' health. It would later be ranked as the worst facility in the entire DOE complex. Leroy Krumback worked there from 1959 through 1974, when he died at age sixty-five of colon cancer. His widow Florence remembered her husband's accounts of contamination on the job, how he'd come home with his hands rubbed raw from scrubbing with Clorox, which was supposed to remove the plutonium. Her attempts to receive compensation for his death dragged on until she gave up, in 1979.

By 1980 public sentiment in the area was turning against the facility and there was pressure to shut the plant down. Alice had been invited to lecture in Denver by Dr. John Cobb, professor of Community Health at the University of Colorado medical school. Cobb was fascinated by what Alice had discovered at Hanford and invited her to talk on Mancuso/Stewart/Kneale. "I'd just given my lecture, and Cobb and I were walking back from the hospital, and we got to talking about these compensation cases, and he said, 'what a pity it is that the MSK analysis hasn't reached the stage of being able to help individuals seeking compensation'; I said, 'oh, but it has.'

"I said, 'what you've got to do is find out what dose the person received, how old he was when he got it, do this for every year he was exposed in order to obtain a cumulative dose, and calculate how long an interval elapsed between exposures and death. You modify the dose he received with these variables to come up with the *effective* dose. On the basis of this, you can estimate how much his work exposure has increased his risk.' I call our system the *Ready Reckoner* after that little printed book you got in math classes as a child which would help you do conversions—you know, translate yards into miles and pence into pounds, and old forms into new forms."²⁸

"I said, 'give me this man's doses and I'll tell you whether he should get compensation.' Cobb pricked up his ears and the next day he came back with this man's records and said, what a pity it was he hadn't known about this when he'd been approached by a lawyer and asked to help with the Krumback case. And I said, 'well, leave the records with me, I'll put them through the mill and we'll see what we come up with.' So I submitted this man's case to our calculations—I did it by way of my thank you letter—and sure enough, we found that he was three times as likely to have gotten his cancer from exposure as from natural causes, which meant he was highly eligible for compensation.

"So Cobb went and called Krumback's lawyer, who was no longer in practice, and was told that too long a time had elapsed since the case had



Gabel case the most compelling. "Don Gabel had graduated from high school in Denver and got a job in Rocky Flats as a janitor, when one day he saw an announcement that he could get 'hot pay'—ten cents an hour more—so he took a job that involved working with radioactive materials. He was working with his head right by a pipe that had radioactive gas going through it. When he asked his boss about it, he was told, 'no, no, don't worry about your head; it's only your body you need to worry about.'" Gabel got brain cancer at age thirty and died at thirty-one.

(The pipe was a ventilation duct from the furnace where the plutonium was being fired, and Gabel had spent nearly half his time on the job with his head six inches from it.)

In an emergency hearing held shortly before he died—his speech slurred from brain surgery, his head shaved, a plate in his skull—Gabel described working conditions at Rocky Flats, the frequent contaminations, the nonchalant attitude and inadequate protection, the use of leather gloves worn through to holes for handling radioactive materials. DeBoskey recalls his efforts to get information about the pipe: "the records had disappeared. We asked for permission to go out to the plant and look at the pipe and measure radiation levels from it—but the pipe had disappeared. We arranged to have Gabel's organs tested for plutonium, but within an hour of his death, his widow got a call from someone at Rocky Flats requesting her husband's brain so that they could test it. She consented to release it; they came and got it—then the brain disappeared! The DOE told her it had been lost. We did manage to test the rest of his organs, and they were found to contain some *five thousand times* the plutonium as the average Coloradan."³²

At this point, DeBoskey brought in Alice. "The DOE was basing its case on a study done by a DOE researcher at Los Alamos, George Voelz, who had found an excess of brain cancer at Rocky Flats, eight brain cancers where four would have been expected, and eight other non-specified neoplasms.³³ Alice got curious about the nonspecified neoplasms, and found out that they too were brain cancers, as she'd suspected—which brought the number up to sixteen where four would have been expected." DeBoskey cross-examined Voelz: "he had to admit there'd been an error, and what with the missing brain and the fiddled study, we were able to get Mrs. Gabel compensation."

"They were grueling cases," recalls DeBoskey, "and we did not win them all. We won three, settled three, which is a form of victory, and lost

four or five. The more we got into it, the more sophisticated the DOE opposition got. At a certain point, Alice didn't want to do anymore."

Meanwhile, Gabel's widow remarried and was no longer presumed to be dependent on her deceased spouse, "so she didn't get any benefits—even though she subsequently got divorced and was left sole support of three kids. She got very little money out of the case—and ditto for me. "When we lost, I got nothing, but even when we won, there was very little money involved. Once when I grumbled about this to Alice, she snapped at me: 'if you don't like it, you don't have to take this kind of work.' And she was right. Her fee was ridiculously low; she charged me \$300 for all of her work on Krumback, where someone of her skills could have been charging \$300 an hour."

The lawyers and witnesses working for the DOE contractors had no worry about money, since their fees came out of the public's tax dollars. DeBoskey figured at one point that for the ten cases he'd prosecuted, the government had spent \$2.3 million defending itself, while paying compensation in the range of \$400,000.³⁴ "That showed how important these cases were to it, how worried the DOE was about precedent setting."

"There ought to be compensation for cancer," Alice maintains. "If you are working in a nuclear facility, it should be acknowledged that there is a cancer risk." She believes that the *Ready Reckoner* can reliably ascertain whether a worker has got cancer as a result of exposure on the job and, moreover, that the industry could have saved itself trouble by using it. "We said that about 5 percent of their workers would die as a result of their work—I don't, myself, think it's the appalling threat people seem to—but the industry wanted the figure to be zero. They think if they admit a cancer risk, they'll be responsible for compensating every single case of cancer their workers get, and since about 20 percent of the population gets cancer, that would mean compensating 20 percent of their workforce, which would be a huge cost. But if they adopted our system, they could sort out people who'd got cancer on the job from those who hadn't. If you know the dosage at every stage of a man's life, the date of diagnosis and death, then you can reckon with some accuracy whether he got his cancer from his work. Those who have more than doubled their risk would be entitled to full compensation; those who'd increased their risk by smaller percentages could get smaller contributions. It would remove from the industry the feeling that they were going to have to pay huge sums of money, and everyone would be satisfied that justice had been done."

Chapter 14

Epidemiology and Alice Stewart

"I have two of the ingredients for success in radiation epidemiology—longevity and persistence. Sheer doggedness. I've hung on and here I am, still quietly going on."

"The reason people don't believe in radiation is, it's out of sight, out of mind—then, twenty or thirty years later, someone drops dead. We are dealing with something so imperceptible to the senses and with such late effects—sometimes third and fourth generation effects—that we are very far from solving the mystery."

Alice Stewart sees herself as a kind of medical detective, practicing a Sherlock Holmes type of medicine.

Epidemiology is the search for the causes of a disease, for its etiology. What makes this so difficult with cancer is that the disease may take decades to manifest, and human populations tend to be highly mobile and subject to many influences. "You can't experiment on human populations, you can't give people doses of radiation to see how they react—or you're not supposed to. You can only *observe* the health of people who have been exposed to radiation. You can't control your experiment as you can in a laboratory. You can't eliminate the 'noise.' Yet you must somehow tease out, from the tangle of human life, that a particular exposure has led to a particular cancer, years later."

Background radiation complicates the question: "you're not looking for a spot of trouble against a spotless backdrop; you're looking for a spot of trouble in a very messy situation. You can expect a fifth to a quarter of the population to die of cancer in the normal course of things—so how do you sort out the naturally occurring cancers from those brought about by influences that are over and above?"

long pause, "It's my job to prove that Dr. Stewart's theories are wrong. I am, in effect, trying to disprove her. Hence the strength of our long association." (George to this day refers to and addresses Alice as "Dr. Stewart.")

Second Class Citizens

Epidemiology has come a long way since Dr. John Ryle established the Social Medicine Institute at Oxford. It has seen, since the forties, a slow but steady expansion and now includes the study of diseases with social origins as well as communicable diseases. But as late as the sixties, universities were still refusing to incorporate it into their curricula. "Today epidemiology is a bit more accepted—medical students have at least some introduction to biostatistics; but it remains a second class citizen," says Alice.

The reward structure of modern medicine doesn't favor epidemiology as a research area, notes Robert Proctor in *The Cancer Wars*; the emphasis on high-tech, heroic interventions leaves it low in prestige and funding. Whereas molecular genetics and cancer therapies are lavishly supported, epidemiology and preventive medicine are starved of funding.¹⁷

So too has its ally, industrial medicine, remained a second class citizen. A 1983 survey of U.S. medical schools showed that only 66 percent of responding institutions taught occupational health and only 54 percent included it as a required course.¹⁸ It has developed more in the United Kingdom than in the United States, on account of Britain's stronger trade union movement. But the closest an epidemiologist ever came to winning a Nobel Prize was Sir Richard Doll, whose name was put in for his work on lung cancer and smoking.¹⁹

"Epidemiology still fails to attract physicians. It attracts statisticians and sociologists, mostly biostatisticians with a crash course in medicine; only a small minority of epidemiologists is medically qualified. Physicians flee it—there's a big salary differential. You lose money by going into it. And you lose status—you play second fiddle to the statisticians, who are second class citizens themselves."

Alice herself gave up a brilliant career. "There I was, headed for a practice in Harley Street. My friends thought I was mad to chuck it all in, and I well know the material rewards I gave up—I've had two brothers and a sister who are doctors, so I know what the going rate is. But I knew I didn't want to be a Harley Street physician. You have to have dinner parties—you need a wife. Besides, I was interested in the research end." She admits that most physicians would not want to work under the

conditions she has. "I've been underpaid by comparison with my skills, seriously underpaid, with no special privilege. Most physicians don't want to go down in salary, down in status and authority—why should they give up a lead part, when they could have nurses and students following them about?"

"But I've seen my brothers become bored with their subject and eventually give it up—one took to farming and another to building boats—whereas I've had continued interest. I count myself very lucky."

Alice faults physicians for not seeing the potentials of epidemiology. "The medical profession is very gravely to blame for not putting more of its brains into epidemiology. I'm absolutely certain that the present system of teaching epidemiology just puts medical students off. They come to it too late. They should be introduced to the subject before they get gripped with the fascination of clinical medicine—which *should* grip them. I know the excitement someone has coming from clinical medicine. But if you could get to students before they're seized with this passion and teach them the excitement of looking at disease through the lens of the group, if you could attune them to think of the larger picture every time they looked at an individual disease, you could get them to see the fascination of epidemiology."

"It still hasn't dawned on people how much can be learned by studying groups of people—by taking a telescope to the job instead of a microscope."

Pioneer and Pariah

"One of the founders of radiation epidemiology?" Alice repeats my question. "Well, yes, you could call me that."

"I wasn't a very gifted scholar, but when I found myself as a clinical student, I seemed to have the right material. It was as though I was a craftsman and I was waiting for the day when somebody would give me some good wood and then suddenly I realized I was a carpenter. I had a gift for diagnostic problems."

"I came into epidemiology almost by accident after I'd been a practicing physician, and a very successful one, flying high. I came into the field at the right moment, while it was still young, before it existed as a discipline. It was a great moment to do this—there were so few people there before me, which gave me the freedom to do something imaginative. And then along came the war, which created all these unique opportunities and material to play with."

NEU
SCA

Cancer 78, no. 3 (1998): 301-11; Martin Wainwright, "Hereditary Cancer Link Discovered," *Guardian* 22 July 1998.

7. See, for example, "America's Nuclear Secrets," cover story, *Newsweek* 27 December 1993.

8. The conference was organized by the University of Portsmouth School of Chemistry, Physics, and Radiography and the German Society for Radiation Protection. Dr. Inge Schmitz-Feuerhake of the Department of Physics, University of Bremen, introduced the speakers. Alice has quite a following among dissidents within the German scientific community and has been regularly invited to present papers for the *Gesellschaft fuer Strahlenschutz*, an alliance for environmental preservation founded after the Chernobyl accident, and to testify at public hearings on nuclear waste disposal and reprocessing.

9. "Symposium on Recent Studies of Low-Level Radiation and Implications for Medicine and the Nuclear Industry," 26-27 September 1998, New York Academy of Medicine.

Selected Bibliography

- d'Antonio, Michael. *Atomic Harvest: Hanford and the Lethal Toll of America's Nuclear Arsenal*. New York: Crown, 1993.
- Barber, Renate C., ed. *Half a Century of Social Medicine: An Annotated Bibliography of the Work of Alice M. Stewart*. West Sussex: Piers Press, 1987.
- Bartimus, Tad, and Scott McCartney. *Trinity's Children: Living Along America's Nuclear Highway*. New York: Harcourt, Brace Jovanovich, 1991.
- Berkhout, Frans. *Radioactive Waste: Politics and Technology*. London and New York: Routledge, 1991.
- Bertell, Rosalie. *No Immediate Danger: Prognosis for a Radioactive Earth*. Summitown, TN: Book Publishing Company, 1985.
- Bindman, Lynne et al., eds. *Women Physiologists*. London: Portland Press, 1993.
- Blowers, Andrew, David Lowry, and Barry D. Solomon. *The International Politics of Nuclear Waste*. New York: St. Martin's Press, 1991.
- Bonner, Thomas Neville. *To the Ends of the Earth: Women's Search for Education in Medicine*. Cambridge, MA: Harvard University Press, 1992.
- Boyer, Paul. *By the Bomb's Early Light: American Thought and Culture at the Dawn of the Atomic Age*. New York: Pantheon, 1985.
- Brandon, Ruth. *The Burning Question: The Anti-Nuclear Movement since 1945*. London: Heinemann, 1987.
- Braw, Monica. *The Atomic Bomb Suppressed: American Censorship in Occupied Japan*. Armonk, NY: M. E. Sharpe, 1991.
- Bunyard, Peter. *Nuclear Britain*. London: New England Library, 1981.
- Burchett, Wilfred. *Shadows of Hiroshima*. London: Verso, 1983.
- Busby, Chris. *Wings of Death: Nuclear Pollution and Human Health*. Aberystwyth, Wales: Green Audit Books, 1995.
- Bynum, W. F. *Science and the Practice of Medicine in the Nineteenth Century*. Cambridge: Cambridge University Press, 1994.
- Caufield, Catherine. *Multiple Exposures: Chronicles of the Radiation Age*. Chicago: University of Chicago Press, 1989.
- Cook, Alice, and Gwin Kirk. *Greenham Women Everywhere: Dreams, Ideas and Actions from the Women's Peace Movement*. London: Pluto Press, 1984.
- Cook, Judith. *Red Alert: The Worldwide Dangers of Nuclear Power*. Seven Oaks, Kent: New English Library, 1986.
- Crew, F. A. W. *Measurements of the Public Health: Essays on Social Medicine*. Edinburgh: Oliver and Boyd, 1948.
- Flam, Helena, ed. *States and Anti-Nuclear Movements*. Edinburgh: Edinburgh University Press, 1994.
- Freeman, Leslic. *Nuclear Witnesses*. New York: Norton, 1983.

Selected Bibliography

- Geiger, H. Jack et al., eds. *Dead Reckoning: A Critical Review of the Department of Energy's Epidemiologic Research*. Physicians for Social Responsibility, Physicians Task Force on the Health Risks of Nuclear Weapons Production, 1992.
- Gerson, Joseph. *With Hiroshima Eyes: Atomic War, Nuclear Extortion and Moral Imagination*. Philadelphia: New Society Publishers, 1995.
- Gofman, John. *Radiation and Human Health*. New York: Pantheon, 1983.
- _____. *Radiation-Induced Cancer from Low-Dose Exposure*. San Francisco: Committee for Nuclear Responsibility, 1990.
- Goffman, John, and Arthur R. Tamplin. *Poisoned Power: The Case against Nuclear Power Plants before and after Three Mile Island*. Emmaus, PA: Rodale Press, 1971.
- Grossman, Karl. *Cover-up: What You Are Not Supposed to Know about Nuclear Power*. Sagaponack, NY: Permanent Press, 1980.
- _____. *Power Crazy*. New York: Grove Press, 1986.
- Gyorgy, Anna and friends. *No Nukes: Everyone's Guide to Nuclear Power*. Boston: South End Press, 1979.
- Hendee, William R., ed. *Health Effects of Low-Level Radiation*. Norwalk, CT: Appleton-Century Crofts, 1984.
- Hilgartner, Stephen, Richard Bell, and Rory O'Connor. *Nukespeak: The Selling of Nuclear Technology in America*. San Francisco: Sierra Club Books, 1982.
- Keller, Evelyn Fox. *Reflections on Gender and Science*. 1985. New Haven: Yale University Press, 1995.
- _____. *A Feeling for the Organism*. New York: W. H. Freeman, 1983.
- Kohn, Howard. *Who Killed Karen Silkwood?* New York: Summit, 1981.
- Leff, S. L. *Social Medicine*. London: Routledge and Kegan Paul, 1953.
- Lifton, Jay, Robert Mitchell, and Greg Mitchell. *Hiroshima in America: A Half Century of Denial*. New York: Avon, 1995.
- Lilienfeld, Abraham M., and David E. Lilienfeld. *Foundations of Epidemiology*. New York: Oxford, 1980.
- Lindee, M. Susan. *Suffering Made Real: American Science and the Survivors of Hiroshima*. Chicago: University of Chicago Press, 1994.
- Makhijani, Arjun, Howard Hu, and Katherine Yih, eds. *Nuclear Wastelands: A Global Guide to Nuclear Weapons Production and Its Health and Environmental Effects*. Special Commission of International Physicians for the Prevention of Nuclear War and the Institute for Energy and Environmental Research. Cambridge, MA: MIT Press, 1995.
- McKewon, Thomas. *The Role of Medicine: Dream, Mirage, or Nemesis*. Oxford: Blackwell, 1979.
- McSorley, Jean. *Living in the Shadow: The Story of the People of Sellafield*. London: Pan Books, 1990.
- McWilliams-Tullberg, Rita. *Women at Cambridge: A Men's University—Thought of a Mixed Type*. London: Gollancz, 1975.
- Moss, Ralph. *The Cancer Industry*. New York: Paragon House, 1989.
- Nader, Ralph. *The Menace of Atomic Energy*. 1977. New York: Norton, 1979.
- Proctor, Robert. *Cancer Wars: How Politics Shapes What We Know and Don't Know about Cancer*. New York: Simon and Schuster, 1986.

Selected Bibliography

- Rhodes, Richard. *The Making of the Atomic Bomb*. New York: Simon and Schuster, 1986.
- Roff, Sue Rabbit. *Hotspots: The Legacy of Hiroshima and Nagasaki*. London: Cassell, 1995.
- Rose, Hilary. *Love, Power and Knowledge: Towards a Feminist Transformation of the Sciences*. Cambridge: Policy Press, 1994.
- Rudig, Wolfgang. *Anti-nuclear Movements: A World Survey of Opposition to Nuclear Energy*. Harlow, UK: Longman Group, 1990.
- Ryle, John A. *Changing Disciplines: Lectures on the History, Method and Motivations of Social Pathology*. London: Oxford University Press, 1948.
- Shapiro, Jacob. *Radiation Protection: A Guide for Scientists and Physicians*. Cambridge, MA: Harvard University Press, 1990.
- Shigematsu, I. et al. *Effects of A-Bomb Radiation on the Human Body*. Tokyo: Harwood Academic, 1995.
- Shils, Edward, and Carmen Blacker, eds. *Cambridge Women: Twelve Portraits*. Cambridge: Cambridge University Press, 1996.
- Snow, C. P. *The Search*. New York: Charles Scribner's Sons, 1934.
- Stauber, John, and Sheldon Rampton. *Toxic Sludge Is Good for You: Lies, Damn Lies and the Public Relations Industry*. Monroe, ME: Common Courage Press, 1995.
- Sternglass, Ernest. *Secret Fallout: Low Level Radiation from Hiroshima to Three Mile Island*. New York: McGraw-Hill, 1981.
- Stoler, Peter. *Decline and Fall: The Ailing Nuclear Power Industry*. New York: Dodd, Mead, 1985.
- Timmreck, Thomas C. *An Introduction to Epidemiology*. Boston: Jones and Bartless, 1994.
- Totten, Sam, and Martha Wescoat Totten. *Facing the Danger: Interviews with Twenty Anti-Nuclear Activists*. Trumansburg, NY: Crossing Press, 1984.
- Tuana, Nancy, ed. *Feminism and Science*. Bloomington: Indiana University Press, 1989.
- Wasserman, Harvey and Norman Solomon with Robert Alvarez and Eleanor Walters. *Killing Our Own: The Disaster of America's Experience with Atomic Radiation*. New York: Dell, 1982.