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The United States conducted 66 atmospheric nuclear weapons tests in the Marshall Islands. Twenty-two years later the authorities continue to disagree on when the islands will be safe for resettlement.

GIFF JOHNSON

Paradise lost

The U.S. government is now attempting to prove at Enewetak what it couldn't at Bikini: that it is possible for people to return safely to an area devastated by nuclear weapons. Following completion of a three-year, $100 million nuclear cleanup of Enewetak Atoll in the Marshall Islands—site of 43 nuclear tests—the United States says it is safe for the people who were moved out to return to certain islands. But while the cleanup has been hailed in some quarters as a "remarkable success," controversy is developing over whether or not people should return to any part of the atoll.

The Marshall Islands are part of a U.N. "strategic" Trust Territory of the Pacific, which has been administered by the United States since World War II. The nuclear weapons testing program ended in 1958, after 12 years of 66 atmospheric tests.

The Defense Nuclear Agency, coordinator of the cleanup, has said it would be impossible to lower atoll radiation to pre-test levels. But the cleanup guidelines called for residence islands to be cleaned to a level of 40 picocuries of plutonium 239/240 per gram of soil, agriculture islands to 80 picocuries per gram and food gathering islands to 160. To accomplish this, thousands of cubic yards of contaminated soil were scraped off the small islands, mixed with cement and encased in a massive concrete dome in an atomic bomb crater at Runit Island.

The basis for the cleanup was strongly questioned in 1974 by a researcher who had been involved in the 1950s weapons testing program at Bikini and Enewetak. Edward Martell, of the National Center for Atmospheric Research, writing to Micronesian Legal Services, a U.S. government organization representing the Enewetak people, expressed concern over the

"highly questionable recommendations regarding acceptable levels of plutonium in the soils and the very doubtful merits of proceeding with the resettlement of Enewetak Atoll on the basis of the recommendations of a Task Group assembled by the Atomic Energy Commission and the Department of Defense. . . . The recommendation that plutonium soils, with levels not exceeding 40 pCi of plutonium 240/241 per gram of soil averaged over 15 cm depth, is suitable for human habitation, can be very seriously questioned. . . . The resettlement of such sites is extremely likely to have tragic consequences, particularly for the younger members of the inhabitants. Progressively worse consequences are to be expected for each successive generation in the affected population group."[1]

Martell's questions and recommendations were ignored and the cleanup itself was plagued by shoddy safety standards.

The Defense Nuclear Agency maintained that "the most important consideration in the cleanup operations was the radiological safety of the individuals involved in the operations."[2] But Agency policies have been inconsistent, and information supplied by soldiers involved in the cleanup and by independent reporters do not substantiate its claims.

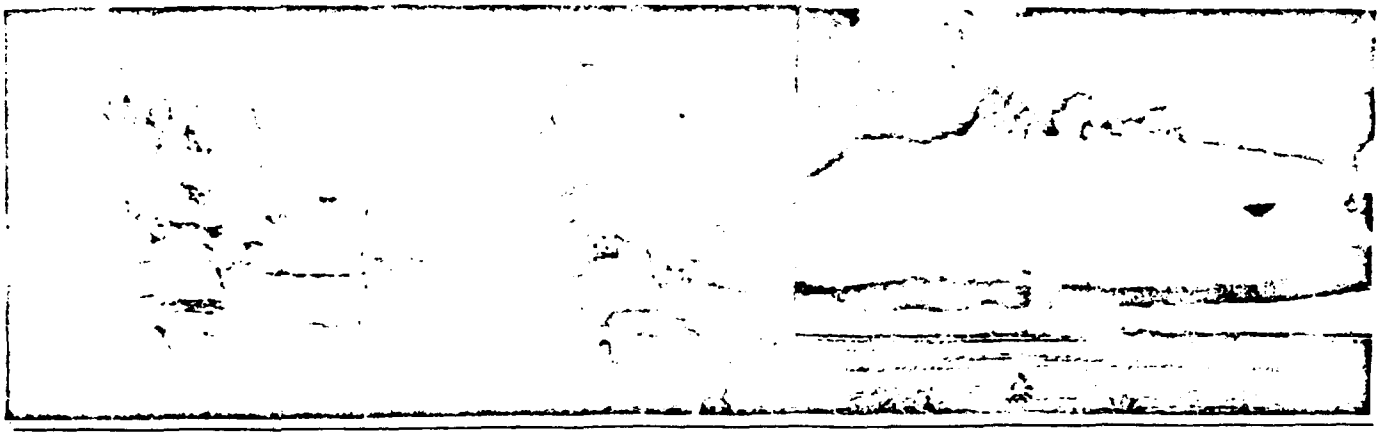
One of many reports from Enewetak was publicized in an exclusive television interview, in which a mechanic stated that he and others had worked without protective gear underneath dozens of trucks returning from the plutonium-contaminated islands. He said "the tires and underside of the vehicles were usually covered with dust and dirt," but the workers were given no respirators for protection.[3]

Press visitors to Enewetak in April 1980 noticed similar flaws in Defense Nuclear Agency safety standards. "Standing on any part of Runit Island," said a reporter, "you must wear rubber boots and a paper respirator to prevent breathing plutonium particles. But standing on the concrete dome (a mere 15 feet away) you are not required to wear any protective clothing at all."[4]

Runit Island will be quarantined to the Marshallese forever, because of high concentrations of plutonium in the soil. More than 100,000 cubic yards of radioactive soil and debris have been encased in a massive cement dome on Runit, to isolate these hazardous materials from the environment for thousands of years.

Nevertheless, islands within three miles of Runit have been designated as safe for "picnics and food gathering." This prompted a Marshallese observer to comment: "What will happen if birds, crabs, turtles and other animals that land on the off limits island are eaten by the people?"

Despite this atmosphere of inconsistent safety measures, many of the 450 Enewetak people have



already moved back to the southern islands, which the Agency calls "relatively uncontaminated." Meanwhile, the Department of Energy says the atoll's northern islands—where the majority of the 43 nuclear tests occurred—should be off limits for at least 30 years, since radiation levels are still high there.

Because of the Department ruling, millions of dollars have been spent on building houses and community facilities and on replanting thousands of coconut trees in the southern islands; but no funds have been used to rehabilitate the northern islands. This has caused problems among the Enewetak people as, traditionally, they are divided into two distinct groups: the *Dri-Enjebi* in the northern and *Dri-Enewetak* in the south. Accustomed to their own chiefs and land, the Dri-Enjebi are reluctant to live on another chief's land.

In September 1979, the radiological information about Enewetak was presented by the Department of Energy to the people. Michael Bender and Bertrand Brill, two scientists hired by Micronesian Legal Services then testified that their study showed *all* the islands to be safe for habitation, including northern Enjebi Island. The chances of adverse effects were so small, they had concluded, that "cancer mortality in the lifetime of the population is estimated to be less than a single case."[5] They asserted that the Department of Energy overstated the risk: "DOE tends to exaggerate the problem," said Micronesian Legal Service Director Ted Mitchell.[6]

The Enewetak people have an intense desire to return home, after 33 years on tiny Ujelang Atoll. And on the basis of this information, the Enjebi people voted to return to their island in the north. But the objectivity of the study conducted by Bender and Brill, whose base is the government-funded Brookhaven National Laboratory, has been questioned. Dr. Rosalie Bertell, a consultant to the Division of Standard Setting for the Nuclear Regulatory Commission, said of the study:

"The population of Enewetak has the right to know that a value judgment has been made for them, namely that induction of cancer is their *only* concern. They may, if informed about hypothyroidism, aplastic anemia, premature aging, benign tumors and other such disorders, make a different judgment.

. . .

They 'reduced' the radiation dose of the inhabitants of Enjebi by averaging in the population less exposed. This is like telling one member of a family his or her risk of lung cancer is lowered if the other nonsmoking members of the family are included and an 'average' risk given. It is a scientifically ridiculous approach to public health.

Basing a resettlement decision affecting the lives of 500 people on the Bender and Brill inadequate health assessment would be extremely imprudent."[7]

Glen Alcalay, a former Peace Corps Volunteer in the Marshalls, said the problem is "the inherent conflict of interest in having Brookhaven researchers assess U.S. government data. . . . The history of the U.S. testing program was one of repeated mistakes and miscalculations." In his view, "non-government radiation experts" should be included in all such surveys.[8]

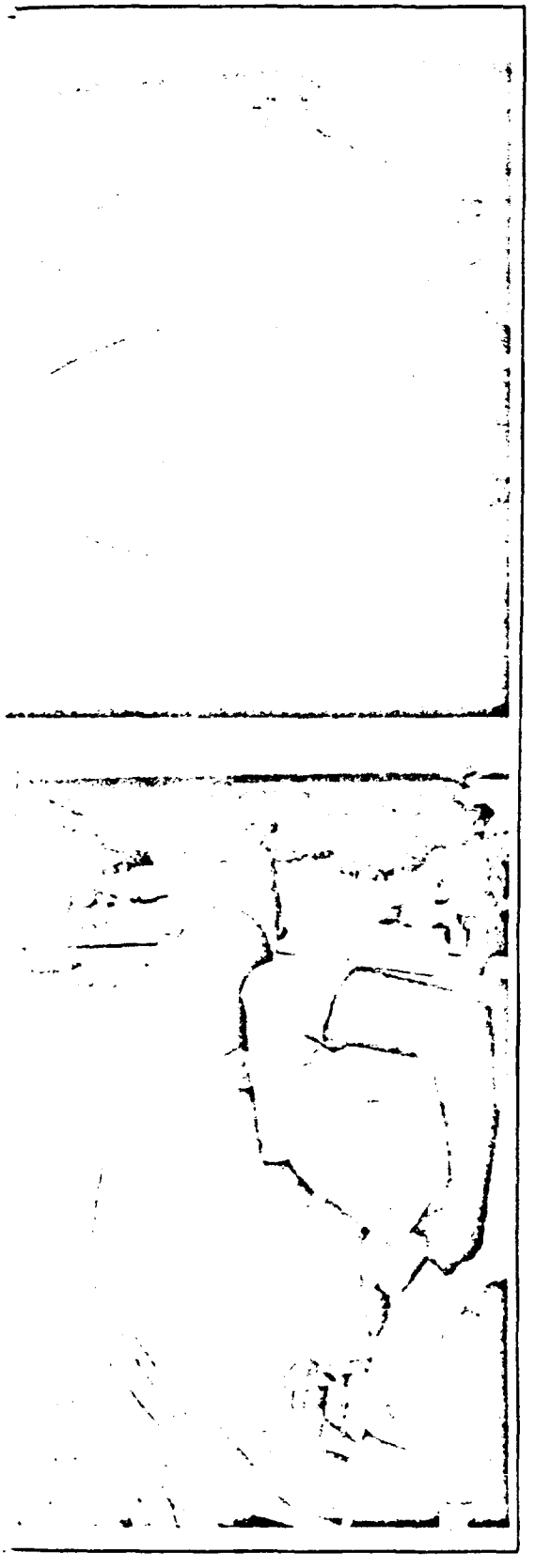
A May 1979 General Accounting Office report cautioned that "because of uncertainty of the long term effects of exposure to low level radiation, it is possible that the people of Enewetak could receive doses in excess of current standards." It also urged an independent assessment of Enewetak by "experts who have no direct connections with the nuclear testing program or the Enewetak cleanup project . . . before resettlement of the people begins."[9] This report was initially withheld from the Marshall Islands government for political reasons.

Since deporting an independent team of Japanese scientists invited by Marshall Islands leaders to investigate the radiation problems in 1971, the United States has steadfastly refused to allow independent monitoring of the Marshallese people and their environment.

President Lyndon Johnson announced in 1968 that Bikini—site of 23 bomb tests—would be returned to its people, who had been living in exile since 1946.

In 1969, the Atomic Energy Commission said: "[there is] virtually no radiation left on Bikini" and "the exposures to radiation of the Bikini people do not offer a significant threat to their health and safety."[10] A small-scale cleanup and rehabilitation program was begun and

By May 1978, a high percentage of the Marshallese body levels were above the maximum permissible dose and the Bikinians were evacuated again.



(left) People walking on the concrete dome covering an atomic bomb crater on Runit Island, Enewetak atoll. (below) Nuclear clean up on Runit Island. (left) U.S. Army personnel in full protective gear. (right) Army personnel mixing plutonium-contaminated soil with cement to form the massive concrete dome.

Robert Conard of Brookhaven National Laboratory—which has coordinated the Marshall Islands medical program since 1954—estimated the health risks of the exposure:

"Assuming that they [143 people] had all been there since 1970 and received the average estimated integrated total dose of 2.6 rems for the period, based on known radiation-induced risk data, one would expect only about 0.005 total cases of leukemia to develop in that population as a result of their radiation exposure.

The need for further medical examinations is not indicated based on possible radiation effects associated with such low doses."[14]

But Dr. Konrad Kotrady, a former Brookhaven resident physician in the Marshalls, strongly disagreed with this philosophy:

"The people fail to understand how scientists can say they do not know all the possible late effects the radiation can cause . . . and then tell the people a medical program is unnecessary.

If in 40 or 50 years medical problems do occur as a result of the exposure, it would be better if a well designed medical program was already in progress to detect the problems."[15]

Conard and representatives of other U.S. government agencies, in apologizing for the complications which occurred, frequently say that radiation measurement techniques then were not as sophisticated as those available today; that the surveys of Bikini were far less extensive than those subsequently carried out at Enewetak atoll.[16] The facts, however, suggest otherwise.

In 1972-1973, the United States conducted an "exhaustive radiological survey of Enewetak," which included both ground and aerial surveys of the islands, according to the Department of Energy. It was not done at Bikini, however. In fact, it wasn't until the Bikinians filed a federal law suit in 1975, asking for a thorough radiological survey of Bikini and the northern Marshall Islands, that the government agreed to do it. But because of three years of bureaucratic infighting among the Departments of Energy, State and Interior, the radiological survey was not conducted until *after* the evacuation of Bikini in late 1978.

The United States did have sophisticated techniques for measuring radiation at the outset of the Bikini resettlement; it chose to employ them only at Enewetak.

U.S. policies with respect to protecting the health of the Marshallese have been totally inconsistent. For example, in 1946, prior to the first nuclear test series, Operation Crossroads, the people from islands within a radius of 300 miles of Bikini—including the Rongelap—were evacuated as a safety precaution.[17] The yield of these bombs was approximately 20 kilotons. But in 1954, there was no official warning of the Bravo test, much less an evacuation of the populations. Yet Bravo was the largest U.S. hydrogen bomb tested—more than 15 megatons. More than 200 Marshallese on

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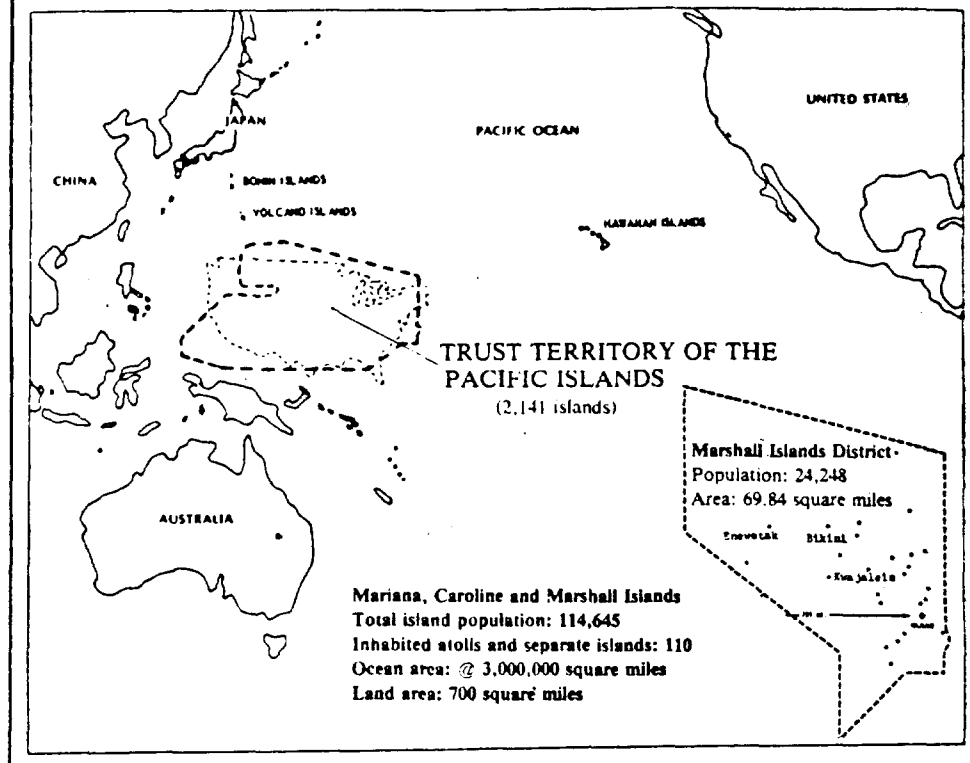
by the early 1970s a few people had begun moving back.

Many Bikinians tell of Atomic Energy Commission scientists taking them to Bikini to demonstrate its safety. When the Bikinians refused to eat any local foods, fearing radiation exposure, the scientists would consume conconuts, fish and other foods in front of the islanders to convince them.[11] In 1972, however, the Bikinians expressed doubts about the safety of their atoll and voted not to return home. But the government was committed to the resettlement and offered Marshallese government employees free food and housing if they would move to Bikini.

During an Atomic Energy Commission survey of the more than 100 people living on the atoll in 1975, the "presence of low levels of plutonium" in their urine was discovered. The Commission, and later the Department of Energy, did not consider this "radiologically significant."[12] By 1977, tests showed an 11-fold increase in the people's body burdens of cesium-137. Rather than remove the population from a hazardous environment, however, the Department of Energy suggested that the Trust Territory government institute a complete feeding program, to reduce consumption of local foods, and thus exposure.

The Department seemed reluctant to give up what one Lawrence Livermore Laboratory study called "possibly the best available source of data for evaluating the transfer of plutonium across the gut wall after being incorporated into biological systems."[13] The situation deteriorated further and by May 1978, a high percentage of the Marshallese body levels were above the maximum permissible dose allowed in the United States. The Bikinians were evacuated again.



The fact that in the Marshall Islands thyroid cancer is more prevalent in people exposed to lower than to higher levels of radiation is not widely known in the United States.

nearby Rongelap and Utirik atolls, were severely contaminated with ash-like fallout.

For many years people have debated whether or not the Marshallese were deliberately exposed. The official position is that upper level winds changed suddenly after the blast, depositing fallout on the inhabited islands. Admiral Lewis Strauss of the Atomic Energy Commission, at a press conference on his return from Bikini in 1954, said of Bravo ". . . at no time was the testing out of control." He added, "No test is made without a definite purpose and a careful determination that is directed to an end result of major importance. . . ."[18]

Nevertheless, within hours of their exposure (at Rongelap, 175 rems, and at Utirik, 14 rems) the people began to suffer from nausea and severe itching of the skin; skin burns and loss of hair occurred in the following weeks. Since then, 19 out of 22 children exposed on Rongelap have had surgery for removal of thyroid nodules. In 1972 a youth, barely a year old at the time of his exposure in 1954, died of myelogenous leukemia. A 1977 report by Brookhaven states: "Recently about 50% of the exposed Rongelap people showed hypothyroidism without clinical evidence of thyroid disease, a finding that probably portends trouble ahead."[19]

"For twenty two years, the people [of Utirik] have heard Dr. Conard and other doctors tell them not to worry, that the dose of radiation received at the island was too low to cause any harmful effects.

However, it has become apparent that the theory was wrong. . . . There is as much thyroid cancer at Utirik as at Rongelap."[20]

A 1976 Brookhaven annual report confirmed the finding that thyroid cancer is actually *more* prevalent in the people who received low level exposure than in the high level group.[21]

A questionable decision by the Atomic Energy Commission allowed the Utirik people to return to their atoll within six months of the Bravo test in 1954 and the Rongelap people after three years. Little radiological cleanup was done on either atoll, but both were declared safe despite "slight lingering radiation."[22]

Some 20 years later, the Department of Energy has decided the islands were not safe. Shortly after the northern Marshalls radiological survey was finished, Department of Energy scientists went to Rongelap in early 1979 and told the people that the northern islands in their atoll, which for the past 20 years they have used for food gathering, were too radioactive to visit. Moreover, the Department of Energy survey shows that islands in Rongelap—only 125 miles from Bikini—have radiation levels at least equal to, and in some cases higher than, an island at Bikini.

Since the 1954 Bravo incident, the United States has stated unequivocally that only the atolls of Bikini, Enewetak, Rongelap and Utirik were contaminated during the weapons tests. But in 1978, the Department of Energy suddenly reversed itself and reported: "In addition to Enewetak, Bikini and Rongelap Atolls, there are eleven other atolls or single islands that received intermediate range fallout from one or more of the megaton range tests."[23]

One of these atolls in the northern Marshalls is Likiep. According to a careful report in the *Micronesian Independent*, June 6, 1980:

"Out of 406 people who live in Likiep, there are documented reports that list nine women who have given birth to babies with severe mental retardation, one woman who had three 'strange' still born babies, one 'completely unrecognizable as human.' Also reported among women on Likiep were ten other babies that were not normal, a quite high percentage of the population."[24]

No medical program exists for the people from these islands, but the list of miscarriages, deformed babies, cancers, thyroid nodules and environmental problems from supposedly unexposed atolls is steadily growing. Because Brookhaven does not examine people from these other islands, the government has been able to deny that any health problems exist on the grounds that there are no data.

Even on Utirik and Rongelap, Brookhaven has taken an extremely narrow view of the problems, according to Kotrady. In his 1977 critique he said:

"The original purpose of the program was to be as broad as possible to discover all possible effects. . . . Over the years, however, data from various sources and opinions of experts have assessed what long term effects should be found in the people. Thus the program seems to operate in a mode of looking for those effects predicted by experts. . . . It tends to focus on specific areas, such as the thyroid and blood, where the scientists expect effects to occur."[25]

Much of the information concerning low level radiation in the Marshalls is relevant to the United States, in view of the uncertainty surrounding Three Mile Island, military personnel exposed to nuclear tests, and so forth. The fact that in the Marshalls thyroid cancer is more prevalent in people exposed to lower than to higher levels of radiation is not widely known in the United

It is an irony of history that the U.N. Trust Agreement binds the United States both to 'protect the health of the inhabitants' and 'protect the inhabitants against the loss of their land or resources.'

States. Similarly, exposure through concentration of radiation in the food chain is not well understood, yet this appears to have been a major contributor to the alarming rate of problems at Rongelap, Utirik and other islands. At Bikini it was the reason for evacuating the people in 1978, and who can guarantee the future of the Enewetak people?

Moreover, in October 1980 the Department of Energy stated that it is now safe for the Bikinians to return to a certain island in Bikini Atoll. It was claimed that the people will not receive doses above the federal radiation standards if they import 50 percent of their food and spend no more than 10 percent of their time on Bikini Island, approximately six miles away.

It is an irony of history that the United Nations Trust Agreement binds the United States both to "protect the health of the inhabitants" and "protect the inhabitants against the loss of their land or resources."[26]

With medical examinations and environmental surveys by doctors and scientists independent of the U.S. government, combined with a thorough education program on radiation, at least the diagnosis and treatment of the Marshallese will improve. But unless the independent scientific community in the United States becomes more involved in the health problems on these islands, it is likely that the inhabitants will serve primarily as a source for U.S. government research into the effects of radiation on human populations.□

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5. "Enewetak Islanders Plan Return," Honolulu Star Bulletin, Sept. 26, 1979.

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