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Bravo's Fallout: International Law and Nuclear Pollution in the Pacific

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COMMENTS

Bravo's Fallout: International Law and Nuclear Pollution in the Pacific

I. INTRODUCTION

Modern developments in international law could be described with great oversimplification as following a pattern. A few major powers develop norms of international law, most of which appear on their face to be morally justifiable. A few such norms, however, are developed to ease or justify the exploitation of weaker, less developed states and territories. Even apparently equitable norms are sometimes twisted to serve this goal. As less developed areas gain increasing independence and political power, they tend to reject many of the old norms and seek to influence the development of a new body of international law. Many of the changes suggested by these new participants in the international arena represent attempts to safeguard their own important and legitimate interests. Some are efforts to establish standards which will protect the interests of all mankind. Some may be reflex reactions against anything that can be associated with former colonial exploitation.

This paper attempts to illustrate how the process described above has been unfolding in the Pacific in the development of international law regarding nuclear pollution. In the late 1940's and the 1950's, when the United States developed norms of international law which were used to justify atmospheric and surface nuclear testing in the Pacific, islanders were unable to protect themselves against this threat to their health and their resources. In the 1960's and early 1970's, when France relied in part upon the old American arguments to justify its above-ground nuclear tests in Polynesia, Pacific nations and territories were able to counter with legal maneuvers and protests that eventually helped force the French tests underground. More recently, a combination of Pacific microstates and territories was able to pressure Japan into abandoning plans to dump nuclear wastes in the Pacific. In doing so, they may have prevented larger powers from establishing a legal regime which would have sanctioned ocean dumping of nuclear wastes.

Pacific islanders have been in the forefront of efforts to develop a new international legal perspective regarding nuclear activity, and they will probably continue to be active in future disputes involving nuclear uses of the ocean. These issues are of paramount importance to Pacific

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islanders because American weapons tests have made them well aware of the dangers of nuclear pollution. Nuclear radiation can cause genetic damage, cancer, other health problems, and, of course, death. Some of these symptoms do not develop until several years after exposure. Nuclear pollution of the ocean enters the sea's food chain—and the final consumers at the end of the chain are often human. It is not certain just what levels of radiation, and therefore what amounts or forms of nuclear pollution, are "safe." The amount of radiation exposure considered safe is continually being lowered as more is learned about its effects.¹ One commentator has stated, "Even though effects of radiation exposure have been studied more extensively than those of any other environmental pollutant, the only definitive finding so far appears to be that no absolutely safe level of radioactivity can be asserted."² Even a "safe" level of ocean pollution would be added to other sources of radiation that humans are exposed to, such as x-rays and background radiation. It is not always possible to tell just what "safe" straw will break a camel's back. Pacific islanders have already had many straws, some quite unsafe, placed on their backs. They are reluctant to accept any more.

II. NUCLEAR WEAPONS TESTS IN THE PACIFIC³A. *American Tests in the Marshall Islands*

Between 1946 and 1958, the United States conducted sixty-six atmospheric, surface, and underwater nuclear weapons tests on and in the vicinity of Enewetak and Bikini Atolls. These atolls are located in the Marshall Islands, which are part of the Trust Territory of the Pacific Islands, a joint United States-United Nations strategic trust administered by the United States.⁴ Before the first tests, the United States es-

1 G. Johnson, *Radiation and Health*, NEW PAC [The New Pacific], Nov.-Dec. 1980, at 33, *Lawsuits Test U.S. Role in Cancers*, Chi. Tribune, April 5, 1979, at 1, col. 1, 8, col. 2 [hereinafter cited as *Lawsuits*].

2 Comment, *International Law and Radioactive Pollution by Ocean Dumping. With All Their Genius and With All Their Skill*, 11 SAN DIEGO L. REV. 757, 758-59 (1974).

3 Because this paper is concerned with the reactions of Pacific islanders to nuclear activities, and the effect of those reactions on international law, the discussion in this section will be limited to U.S. and French tests in the Pacific. Testing by the U.S., USSR, and other nations in their own territory will not be discussed. The British tests in the Pacific in the 1950's will not be discussed, as they had much less of an impact on attitudes and law than the concurrent, more numerous U.S. tests. The effects of U.S. tests upon American servicemen in the Pacific are also outside the scope of this paper.

4 The Trust Territory (T.T.), also known as Micronesia, consists of over 2,000 islands. Less than 100 are inhabited. It is located in the western Pacific just north of the equator. The islands have been a Spanish colony, a German colony, and a Japanese League of Nations mandate. In the current trusteeship, the United States has full administrative powers and the United Nations role is minimal. The T.T. has divided into four separate political entities recently in anticipation of the end of the Trusteeship: Three—the Federated States of Micronesia (FSM), the Republic of

established a 180,000 square mile "danger zone" from which ships and planes were banned. This zone grew to 400,000 square miles in 1954 when "Bravo," the first hydrogen bomb ever tested, was detonated on Bikini on March 1. Nearby inhabited atolls were showered with radioactive fallout from this test. Japanese fishermen just outside the danger zone were exposed to Bravo's fallout; all required medical treatment and one died. In 1958 President Eisenhower suspended United States testing. When testing resumed, thirty-seven additional tests were conducted outside the Trust Territory at Christmas and Johnston Islands. These tests required a danger zone of 1.2 million square miles on the ocean surface and 2 million square miles in the airspace above.

These tests quickly provoked a debate as to their legality. Dr. Emanuel Margolis, a member of the American Society of International Law, was one of the first to voice his opposition to the tests. He claimed that the danger zone was an illegal exercise of state sovereignty over the high seas, interfering with customary freedoms of fishing, navigation, and aerial movement.⁵ He cited the *Trail Smelter*⁶ case to illustrate that, under international law, no state has the right to use its territory in such a manner as to cause the pollution of the territory of other states when the pollution is of serious magnitude.⁷ He then discussed United States cases which had held that a state can be enjoined from activities which pollute interstate waters if the pollution is of a serious magnitude.⁸ Margolis then turned to article 73 of the United Nations Charter, which requires that states administering non-self-governing territories accept as a sacred trust the obligations to promote the well-

Belau (Palau), and the Marshall Islands - will probably become independent nations in "free association" with the United States. The fourth, the Commonwealth of the Northern Marianas, will become a U.S. commonwealth. All four entities have recently formed democratically elected governments, which currently coexist with the territorial administration. See generally Armstrong, *The Emergence of the Micronesians into the International Community: A Study of the Creation of a New International Entity*, 5 BROOKLYN J. INT'L L. 207 (1979); Clark, *Self-Determination and Free Association—Should the United Nations Terminate the Pacific Islands Trust?*, 21 HARV. INT'L L.J. 1 (1980).

5. Margolis, *The Hydrogen Bomb Experiments and International Law*, 64 YALE L.J. 629, 631, 635 (1955).

6. *Trail Smelter Case* (United States v. Canada), Arbitral Tribunal, 1941, (3 R. Int'l Arb. Awards 1905 (1949)). The case involved a smelter in Canada which emitted sulphur dioxide over the state of Washington. The tribunal held that under principles of international law no state has the right to use or permit the use of its territory in such a manner as to cause injury by fumes in or to the territory of another state, or to persons therein, when the injury is of serious consequence and is established by clear and convincing evidence. The tribunal applied this principle to hold that the Smelter would be required to refrain from causing further damages through border-crossing pollution. It further held that Canada would pay damages to be agreed upon by the two governments, such damages to be equivalent to those recoverable under the decisions of U.S. courts in suits between private individuals.

7. Margolis, *supra* note 5, at 642.

8. *Id.* *New Jersey v. City of New York*, 283 U.S. 473 (1931), *New York v. New Jersey*, 256 U.S. 296 (1921).

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being of the inhabitants of these territories, ensure their just treatment, and protect them against abuses.⁹ He also cited the Trusteeship Agreement between the United States and the United Nations for Micronesia.¹⁰ Article 6 of the Agreement requires that the United States protect the land, resources, and health of the territory's inhabitants.

Margolis closed with moral arguments. He claimed it would be difficult to convince other governments of United States moral superiority over the Soviets if the United States had "unclean hands."¹¹ He recommended that the tests be shifted to the continental United States or Alaska, saying, "If we are not prepared to expose *ourselves* to these hazards, *a fortiori* we have no right to expose other people to them in order to protect our citizens. Both morals and logic dictate that the risk of thermonuclear tests should be born by the state benefiting from them."¹²

The leading proponents of the legality of United States testing were Myres S. McDougal, Professor of Law at Yale Law School, and Norbert A. Schlei, a member of the editorial board of *Yale Law Journal*. In an oft-cited article, they denounced criticisms of the tests as "invective" and "spurious legalisms,"¹³ while calling critics imperceptive.¹⁴ Their contentions rested upon a series of balancing tests used to determine reasonableness, a series in which security interests knocked down one apparent straw man after another. Balancing security against interference with navigation and air traffic, they noted that freedom of the seas has traditionally yielded to naval maneuvers.¹⁵ While admitting that over 100 tons of fish were condemned in Japan because of high levels of radio-activity, and that fish prices fell 50% in Japan after the tests, they cited a variety of statistics to show that the harm to the worldwide fishing industry was minor, and suggested that fishermen simply go elsewhere.¹⁶ They criticized the suggestion that the tests be conducted inside the United States, indicating that there is no suitable site.¹⁷ They

9 Margolis, *supra* note 5, at 644.

10 *Id.* at 645, referring to Trusteeship Agreement for the Former Japanese Mandated Islands, approved by the United Nations Security Council, Apr. 2, 1947, and by the United States, July 18, 1947, 61 Stat. 3301, T.I.A.S. No. 1665, 8 U.N.T.S. 189 [hereinafter cited as *Trusteeship Agreement*]. The *Trusteeship Agreement* created the current Trusteeship, in effect providing international recognition of U.S. control in Micronesia in exchange for a UN advisory role. See generally Comment, *International Law and Dependent Territories: The Case of Micronesia*, 59 TEMP. L.Q. 58, 71-75 (1971).

11 Margolis, *supra* note 5, at 646.

12 *Id.* at 647.

13 McDougal & Schlei, *The Hydrogen Bomb Tests in Perspective: Lawful Measures for Security*, 64 YALE L.J. 648, 649 (1955).

14 *Id.* at 695.

15 *Id.* at 675.

16 *Id.* at 694.

17 *Id.* at 708 n.321. This would appear to be both an acknowledgement of the risks McDougal and Schlei minimized elsewhere and a criticism of tests which did take place in the U.S.

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disposed of *Trail Smelter* by noting that it did not involve security issues.¹⁸

McDougal and Schlei's handling of the United Nations Charter and the Trusteeship Agreement is most interesting. As the Charter does not preclude self-defense, they determined that it permits anticipatory self-defense.¹⁹ They noted that the Trusteeship Agreement gave the United States virtually unrestricted powers in matters relating to security,²⁰ and concluded that security was the main purpose of the Agreement.²¹ Therefore, any duties the Agreement imposed upon the United States regarding Trust Territory inhabitants are not "unqualified imperatives,"²² but instead are to be subordinated to any United States security interests.²³

McDougal and Schlei have provoked a great deal of comment, some of it based on information which became available after their work was published. Howard J. Taubenfeld, a Visiting Research Scholar at the Carnegie Endowment for International Peace, acknowledged that just because one may be liable for damages, one may still, under certain circumstances, be legally able to engage in the activity causing pollution. However, he noted that cases following this principle did not involve the "right to kill or maim."²⁴ While admitting that in the international arena any balancing of interests must take account of security, he commented that "as Hitler demonstrated, the demand for 'security' may serve only to conceal rapacity and indifference to human suffering."²⁵ J.W.L. Swan, Lecturer in Law at the University of Melbourne, stated that while there is a custom of naval maneuvers, there is no custom of nuclear danger zones.²⁶ A.G. Mercer, a member of the faculty of law at Victoria University of Wellington, noted that the duration and effects of nuclear tests far exceed those of naval maneuvers.²⁷ On the other hand, Mercer stated that *Trail Smelter* developed norms for liability, not for the prohibition of prospectively harmful

18 *Id.* at 690.

19 *Id.* at 687. One problem with this approach is that any act of aggression could be labeled "anticipatory self-defense."

20 *Id.* at 699. See *Trusteeship Agreement*, *supra* note 10, arts. 3, 5.

21 McDougal and Schlei, *supra* note 13, at 703.

22 *Id.* at 705.

23. One might be reluctant to contract to sell a car to someone who agreed with this approach. By application of analogous reasoning, it could be determined that the main purpose of the contract was to provide the buyer with transportation. Once this purpose was achieved, the buyer could determine that any remaining provisions relating to payment are not unqualified imperatives, and can therefore be disregarded.

24 Taubenfeld, *Nuclear Testing and International Law*, 16 Sw. L.J. 365, 404 (1962).

25 *Id.* at 405.

26. Comment, *An Explosive Issue in International Law: The French Nuclear Tests*, 9 Melb U.L. Rev. 296, 300 (1973-74) [hereinafter cited as Comment, *Explosive Issue*].

27. Mercer, *International Law and the French Nuclear Tests*, 1968 N.Z.L.J. 405, 407 (Sept. 17, 1968).

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activity.²⁸

Peter J. Fleiss, a Professor of Government at Louisiana State University, commented that McDougal and Schlei "would stretch the right of self-defense of the United States in relation to nuclear testing to the point of eliminating most restraint, and one may very well wonder whether there remains any law at all if such permissive interpretations are countenanced."²⁹ He discussed the possibility that the tests could conflict with customary law developed from the Nuremberg Trials, the Genocide Convention, the Hague Conventions of 1899 and 1907, and the Geneva Protocol on Poisonous Gases and Analogous Materials of 1925.³⁰ However, he also suggested that current international law of peace and international law of war are inadequate in a cold war situation, and proposed a new law of cold war under which nuclear testing would apparently be legal.³¹ This proposal was based on his assumption that "there is little chance for test and armament bans."³² This assumption was proven wrong by the Test Ban Treaty.³³

Nuclear tests were criticized by the Asian-African Legal Consultative Committee, an advisory body of legal experts formed by the govern-

28 Mercer, *International Law and the French Nuclear Tests*, 1968 N.Z.L.J. 418, 419 (Oct. 1, 1968).

29 Fleiss, *The Legality of Atmospheric Nuclear Tests—A Critical View of International Law in the Cold War*, 15 U. FLA. L. REV. 21, 24 (1962).

30 *Id.* at 25-26. The Nuremberg Trials after World War II involved Nazi officials charged with crimes against peace, war crimes, and crimes against humanity. Crimes against humanity included murder, extermination, enslavement, deportation, and other inhumane acts committed against any civilian population, before or during the war.

The Convention on the Prevention and Punishment of the Crime of Genocide of December 9, 1948, 78 U.N.T.S. 277, includes in its article 2 definition of genocide acts committed with intent to kill members of a group, cause serious bodily harm to members of a group, inflict on a group conditions calculated to bring about its physical destruction in whole or in part, or prevent births in a group. The U.S. is not a party to this Convention.

The Hague Declaration on Asphyxiating Gases of July 29, 1899 prohibits the use of projectiles, the sole object of which is the diffusion of asphyxiating or deleterious gases. The U.S. is not a party to this treaty.

Article 23(e) of the Hague Regulations on Land Warfare of 1907 prohibits the use of arms, projectiles, or materials calculated to cause unnecessary suffering.

The Geneva Protocol of June 17, 1925 prohibits the use of asphyxiating, poisonous, and other gases, and all analogous liquids, materials, and devices, and bacteriological methods of warfare. The U.S. is not a party to this treaty.

For a more in-depth discussion of the applicability of these sources of international law to nuclear weapons, see G. SCHWARZENBERGER, *THE LEGALITY OF NUCLEAR WEAPONS* (1958); Meyrowitz, *The Status of Nuclear Weapons Under International Law*, 38 GUILD PRAC. 65 (1981). The theory that these sources point towards norms of customary international law which would prohibit above-ground nuclear testing is based in part on two assumptions. The first is that nuclear radiation is similar to the poisonous gases prohibited by some of the above treaties, and perhaps an analogous material under the Geneva Protocol. The second is that if certain acts are so inhumane that they are illegal during warfare, then they must also be illegal during peacetime.

31. Fleiss, *supra* note 29, at 27-32.

32. *Id.* at 32.

33 Treaty Banning Nuclear Weapons Tests in the Atmosphere, in Outer Space, and Under Water of August 5, 1963, 14 U.S.T. 1313, 480 U.N.T.S. 43.

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ments of several Asian, African, and Middle Eastern countries. Their 1963 report, which did not include underground tests, reached the following conclusions:

- 1) Every test results in or is capable of resulting in immediate or delayed widespread damage.
- 2) The present state of scientific knowledge does not indicate that harmful effects of tests can reasonably be eliminated.
- 3) Because of the above conclusions, nuclear tests are international wrongs, even if carried out in a nation's own territory, and can be regarded as an abuse of right.
- 4) A state carrying out tests is absolutely liable for damage caused by such tests.
- 5) Nuclear testing is contrary to principles in the U.N. Charter's Declaration of Human Rights.
6. Tests carried out in the high seas and the airspace above them violate freedom of the seas and freedom of flying above the high seas.
- 7) Tests carried out in trust territories and non-self-governing territories violate articles 73 and 74 of the U.N. Charter.³⁴

In a non-legal work about the Japanese fishermen exposed to Bravo's fallout, author Ralph E. Lapp provided an answer to McDougal and Schlei's claim that the Bravo test had a *de minimis* effect on fishing and was therefore reasonable. After documenting the Japanese reaction to fish contamination, Lapp noted that fish is the major source of protein in the Japanese diet.³⁵ Lapp asked what the reaction would be if the shoe were on the other foot—if American beef were contaminated, and United States supermarkets and butcher shops had to keep on hand what had been a required utensil in Japanese fish markets, a geiger counter.³⁶ American consumers would probably not find this "reasonable," even if it could be shown that their plight was not having an overwhelming effect on the beef industry worldwide. Lapp also noted that high levels of radioactivity were found in fish taken over more than a one million square mile area in the Pacific three months after the Bravo test.³⁷ This statistic provides little support for McDougal and Schlei's "let them fish elsewhere" approach.

McDougal and Schlei's unqualified support of atmospheric nuclear testing was not even embraced by one of this century's master balancers, Henry Kissinger, a man whose sympathy for Micronesia was allegedly displayed in the statement, "There are only 90,000 people out

34. ASIAN-AFRICAN LEGAL CONSULTIVE COMMITTEE THE LEGALITY OF NUCLEAR TESTS (REPORT OF THE COMMITTEE AND BACKGROUND MATERIALS) 244-45 (1963).

35. R. LAPP, *THE VOYAGE OF THE LUCKY DRAGON* 120 (1957).

36. *Id.* at 128.

37. *Id.* at 179

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there. Who gives a damn?"³⁸ In a 1958 article, Kissinger described the cold war situation, the Soviet threat, and the need for continued development of nuclear weapons. Nevertheless, he concluded that the United States, the USSR, and their allies should seek to immediately reduce the amount of fallout released into the atmosphere by nuclear tests, and completely eliminate atmospheric fallout within two years. He supported further nuclear testing, so long as it was limited to underground tests and surface tests of hypothetical clean weapons.³⁹

Some federal courts in the United States have had the opportunity to examine issues related to nuclear testing in the Marshalls. In *Pauling v. McElroy*,⁴⁰ a group of Americans, Marshall Islanders, and others brought suit in the D.C. Circuit Court to enjoin the Commissioners of the Atomic Energy Commission and the Secretary of Defense from detonating nuclear weapons in the Marshall Islands. The court denied their motion for a preliminary injunction and dismissed their complaint. The court stated that the plaintiffs failed to show "that the consideration of possible deleterious effects claimed by plaintiffs to result from such tests outweigh the public interest involved in the development of nuclear weapons through these tests in furtherance of the national defense and safety."⁴¹ It added that the United Nations Charter, Trusteeship Agreement, and principle of freedom of the high seas are not self-executing, and did not vest any of the plaintiffs with individual legal rights.⁴² Finally, the court determined that United States legislation authorizing the tests did not conflict with "the so-called human rights provisions of the Charter of the United Nations," the Trusteeship Agreement, or freedom of the seas. Even if it did, the United States statute would be paramount to any such conflicting provisions.⁴³

On narrow legal grounds, the *Pauling* court may have been correct on some issues. Even though some scientists attempted to inform the United States government about the harmful effects the tests were having on the environment, perhaps worldwide, the government remained, for official purposes, unaware of any such problems.⁴⁴ Many of the harmful effects the testing had on the Marshallese did not become evi-

38. D. McHENRY, MICRONESIA TRUST BETRAYED 87 (1975); Tiffin, Producer, *Who Gives a Damn?*, 60 MINUTES, Dec. 23, 1979, at 1, 2, 5 (transcript).

39. Kissinger, *Nuclear Testing and the Problem of Peace*, 37 FOREIGN AFF. 1 (1958).

40. 164 F. Supp. 390 (D.D.C. 1958), *aff'd*, 278 F.2d 252 (D.C. Cir. 1960).

41. 164 F. Supp. at 392.

42. *Id.* at 393.

43. *Id.*

44. *E.g.*, H. WASSERMAN & N. SOLOMON, KILLING OUR OWN 92-101 (1982); *Danger of Fallout Said Known*, Durham Sun, October 15, 1982, at 2, col. 5. See also *Lawsuits*, *supra* note 1, at 8, col. 2. ("DOE officials . . . said that the 1950's was the time of the Cold War when politicians felt we were in a nuclear weapons race with the Soviet Union. Scientists, living in that climate of fear, were prone to minimize hazards of radiation . . .").

dent until years after the decision. Those Marshallese who had been directly harmed by the tests were being kept on remote islands where they had no access to the court, and from the language in the opinion it appears doubtful that the government informed the court of the details of their plight.

Although the cessation of testing in the Marshalls guaranteed that the *Pauling* issues would not be relitigated, two more recent decisions dealing with related issues indicate that courts further removed from cold war passions might have decided that case differently. In *People of Saipan v. United States Department of Interior*,⁴⁵ the plaintiffs sought to enjoin the construction of a hotel in Saipan, in the Trust Territory, until the environmental impact of the proposed construction had been studied and evaluated. They relied in part upon the previously mentioned provisions of the Trusteeship Agreement which require that the United States protect Trust Territory inhabitants against the loss of their land and resources. The Ninth Circuit Court of Appeals held, "[T]he Trusteeship Agreement can be a source of rights enforceable by an individual litigant. . . . The preponderance of features in the Trusteeship Agreement suggests the intention to establish direct, affirmative, and judicially enforceable rights."⁴⁶

In *People of Enewetak v. Laird*,⁴⁷ the District Court of Hawaii granted a preliminary injunction under the National Environmental Policy Act to stop simulated nuclear blasts on Enewetak without ever considering deference to security interests. The central issue in the case—the applicability of NEPA to the Trust Territory—bears little relationship to the issues in *Pauling*. Nevertheless, the Enewetak court had to resolve jurisdictional and standing issues in the plaintiffs' favor in order to issue the injunction. The *Pauling* court would probably have discussed security needs and then used these loopholes to dismiss the case.

In short, in a case that arose not long after the publication of the McDougal-Schlei article, their theories were followed, albeit without citation. More recently, the *Saipan* court has explicitly rejected their disregard for Micronesian rights under the Trusteeship Agreement. The *Enewetak* court, by omission, implicitly rejected their apparent belief that security interests will win any balancing test against environmental interests and Micronesian rights.

The final decision in any legal dispute depends not only on legal theories, but also upon the facts of the case. While McDougal and Schlei denigrated the importance of article 6 of the Trusteeship Agree-

45 502 F.2d 90 (9th Cir. 1974), cert. denied, 420 U.S. 1003 (1975).

46 502 F.2d at 97.

47 353 F. Supp. 811 (D. Hawaii 1973)

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ment, they claimed, "The duties to promote the welfare of the inhabitants of the Trust Territory assumed by the United States in the Charter and the Trusteeship Agreement, including the duty to protect the inhabitants' land and resources, appear to have been performed in an exemplary manner."⁴⁸ While admitting that 82 Marshallese, as well as some Americans and Japanese, suffered "minor injuries,"⁴⁹ they contended that the total inconvenience suffered by Marshallese as a result of nuclear tests was less than they would have been subjected to if the United States had constructed an airfield on one of their more heavily populated islands.⁵⁰ Most of the legal scholars discussed above accept this version of the facts, and many direct more discussion to the possible harm to fish than to actual harm to humans. The failure of most legal scholars to consider the actual consequences of United States testing in the Marshalls has probably influenced the opinions expressed in their writings, and thereby may have had some influence on the development of international law regarding nuclear pollution of the ocean.

The facts, as described in Pacific regional periodicals and other sources, cast doubt upon contentions that the American nuclear tests caused minimal harm and were therefore reasonable. Before the earliest tests in the Marshalls, which were of twenty kiloton bombs, the people of Rongelap, 125 miles east of Bikini, were evacuated.⁵¹ When Bravo, with its fifteen megaton yield, was tested, they were neither evacuated nor warned to take any precautions.⁵² Rongelap received a one and one-half inch snowfall of radioactive ash from the test.⁵³ As this strange snow fell on the ground, on skin, on food, and into water tanks, Rongelapese children played in it and tasted it.⁵⁴ The Rongelapese continued to walk barefoot in the powder, eat contaminated food, and drink contaminated water until they were evacuated to

48 McDougal & Schlei, *supra* note 13, at 707

49 *Id.* at 651

50 *Id.* at 707

51 G. Johnson, *Paradise Lost*, BULL. ATOM. SCIENTISTS, Dec. 1980, at 24, 27 [hereinafter cited as Johnson, *Paradise*].

52 H. WASSERMAN & N. SOLOMON, *supra* note 44, at 85; G. Johnson, *Micronesia: America's 'Strategic' Trust*, BULL. ATOM. SCIENTISTS, Feb. 197, at 10, 11 [hereinafter cited as Johnson, *Micronesia*]; Johnson, *Paradise*, *supra* note 51, at 27; Sicard, *Compassionate Compensation—Rongelap/Citrik Payments 1978*, MICRONESIAN REP. [Micronesian Reporter], 4th Quarter 1978, at 4. American personnel on Rongerik Atoll, which is 25 miles east of Rongelap and therefore farther away from Bikini, were warned of the test and were provided with protective clothing and shelter. Nevertheless they were evacuated more than 24 hours before the Rongelapese. H. WASSERMAN & N. SOLOMON, *supra* note 44, at 85; Johnson, *Micronesia*, *supra*, at 11.

53. E.g., H. WASSERMAN & N. SOLOMON, *supra* note 44, at 85; G. Johnson, *Marshall Islands, the Radioactive Trust*, N.W. PAC., Nov.-Dec. 1980, at 16 [hereinafter cited as Johnson, *Marshall*]. Various writers range from "over one inch" to "two inches."

54 H. WASSERMAN & N. SOLOMON, *supra* note 44, at 85 (quoting the Rongelapese magistrate), Johnson, *Micronesia*, *supra* note 52, at 11; Kiener, *Inside Glimpes*, GLIMPSES, 4th Quarter 1979, at 2, 2; Sicard, *supra* note 52, at 4.

Kwajalein more than two days later.⁵⁵ Within a few days their symptoms included itching, burning, nausea, vomiting, and diarrhea.⁵⁶ Shortly afterwards many developed burns on their necks, shoulders, arms, and feet.⁵⁷ In 1957 the Rongelapese were returned to their home atoll as a result of a report prepared for the Atomic Energy Commission. It stated, "Even though . . . the radioactive contamination of Rongelap Island is considered perfectly safe for human habitation, the levels of activity are higher than those found in other inhabited locations in the world. The habitation of these people of this island will afford most valuable ecological radiation data on human beings."⁵⁸ By 1958, the incidence of stillbirths and miscarriages in exposed Rongelapese women was more than twice that of unexposed Marshallese women.⁵⁹ By 1961, the body levels of radioactive cesium in exposed Rongelapese had risen sixty-fold. Body levels of zinc had risen eight-fold and strontium-ninety six-fold.⁶⁰ For nine years, the Atomic Energy Commission had told the Rongelapese not to expect any health problems. In 1963 a twelve-year old Rongelapese girl was found to have a nodule on her thyroid gland.⁶¹ Eventually, approximately forty to fifty per cent of the exposed Rongelapese developed thyroid problems,⁶² a rate which can be compared to three to four per cent among Americans.⁶³ Nineteen of the twenty-two Rongelapese children under the age of twelve when Bravo was tested have had surgery for removal of thyroid nodules,⁶⁴ some of which were cancerous.⁶⁵ In 1972 a Rongelapese who had been one year old when Bravo was tested died of myelogenous leukemia.⁶⁶ In 1979 the Department of Energy told the Rongelapese that the northern islands of their atoll, which had been used for food gathering for the preceding twenty years, were too radio-

55 Johnson, *Micronesia*, *supra* note 52, at 16; Pryor, *Nuclear Waste: The Pacific Proving Grounds*, GLEIMPSIS, 4th Quarter 1979, at 16, 17.

56 Johnson, *Marshall*, *supra* note 53, at 16; Johnson, *Micronesia*, *supra* note 52, at 11; Pryor, *supra* note 55, at 17.

57 Johnson, *Marshall*, *supra* note 53, at 16; Johnson, *Micronesia*, *supra* note 52, at 11; Johnson, *Paradise*, *supra* note 51, at 28.

58 Johnson, *Marshall*, *supra* note 53, at 16; Johnson, *Micronesia*, *supra* note 52, at 11-12.

59 Johnson, *Marshall*, *supra* note 53, at 16; Johnson, *Micronesia*, *supra* note 52, at 12.

60 Johnson, *Micronesia*, *supra* note 52, at 12.

61 Pryor, *supra* note 55, at 17.

62 *The Bikini Bomb 24 Years After*, PAC. ISLANDS MONTHLY, May 1978, at 5, 5 [hereinafter cited as *Bikini Bomb*]; Johnson, *Marshall*, *supra* note 53, at 16; Johnson, *Micronesia*, *supra* note 52, at 12; Johnson, *Paradise*, *supra* note 51, at 28 (quoting Conrad, *Summary of Thyroid Findings in Marshallese 22 Years After Exposure to Radiouactive Fallout*, Brookhaven National Laboratories, No. 21924 (1976)); Pryor, *supra* note 55, at 17.

63 Johnson, *Micronesia*, *supra* note 52, at 12.

64 Johnson, *Marshall*, *supra* note 53, at 16; Johnson, *Micronesia*, *supra* note 52, at 12; Johnson, *Paradise*, *supra* note 51, at 28.

65 Johnson, *Marshall*, *supra* note 53, at 16; Pryor, *supra* note 55, at 17.

66 Johnson, *Micronesia*, *supra* note 52, at 12; Johnson, *Paradise*, *supra* note 51, at 28; Sicard, *supra* note 52, at 8.

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active to visit.⁶⁷ Some Rongelapese who were away from the atoll during the Bravo test were among those returned there in 1957. Within a few years, their body radioactivity levels equaled those of exposed persons and were ten times those of Marshallese living on uncontaminated islands.⁶⁸

Although the Rongelapese succeeded in providing "valuable ecological radiation data on human beings," in some ways they were lucky. In a 1979 interview, Maynard Neas, the American administrator of the Marshalls at the time of the Bravo test, said, "If the people of Rongelap had been in the North end of their atoll instead of the Southern end they all would have died."⁶⁹

Like the Rongelapese, the 157 people of Utirik, 275 miles east of Bikini, were not warned to take precautions during the Bravo test.⁷⁰ A day after the explosion, they received a mist-like fallout.⁷¹ They were evacuated more than two days after this exposure.⁷² The Atomic Energy Commission determined that Utirik was only slightly contaminated, and returned the Utirikese three months later.⁷³ Before 1977, eleven Utirikese had developed thyroid tumors, three of which were cancerous.⁷⁴ Suddenly, the rate of thyroid trouble there increased, until it equaled that of Rongelap.⁷⁵ One of the thyroid malignancies on Utirik occurred in the young son of an exposed person. This raised the possibility of either genetic damage or exposure from radiation remaining on the island. Neither possibility had been previously considered by medical officials from the Atomic Energy Commission or its successor, the Energy Research and Development Authority.⁷⁶

When the Bikinians were first evacuated from their islands, they were led to believe that they would be allowed to return home within one or two years.⁷⁷ It was obvious long before the Bravo test that this was not true. An underwater atomic bomb test in 1946 left half a million tons of radioactive mud in Bikini's lagoon. In 1947 scientists found that the lagoon's waters, once clear, had become almost opaque.⁷⁸

67 Johnson, *Paradise*, *supra* note 51, at 28.

68 Johnson, *Micronesia*, *supra* note 52, at 12.

69 Interview: Maynard Neas, MICRONESIAN REP., 2d Quarter 1979, at 2, 4.

70 Johnson, *Micronesia*, *supra* note 52, at 11; Sicard, *supra* note 52, at 4.

71 Pryor, *supra* note 55, at 17.

72 Johnson, *Micronesia*, *supra* note 52, at 12.

73 *Id.* at 11; Pryor, *supra* note 55, at 17.

74 Johnson, *Micronesia*, *supra* note 52, at 12; Pryor, *supra* note 55, at 17.

75 Johnson, *Marshall*, *supra* note 53, at 16; Johnson, *Micronesia*, *supra* note 52, at 12; Johnson, *Paradise*, *supra* note 51, at 28.

76 Pryor, *supra* note 55, at 17.

77 *Id.* at 18.

78 *Id.* at 17, 19.

The Bikinians were initially relocated in Rongerik atoll, which has one quarter of Bikini's land mass and lagoon area. Many of the fish in this tiny lagoon were toxic, but the Bikinians had to eat them to avoid starvation.⁷⁹ Within a year, they were "visibly suffering from malnutrition."⁸⁰ The Bikinians were temporarily relocated on Kwajalein and then sent to Kili.

Kili has one quarter of the land mass of Bikini. It is a single island, not an atoll, and therefore has no sheltered fishing or protected anchorage. Traditional Bikinian skills which had guaranteed survival for centuries in an atoll environment were worthless on Kili.⁸¹ The waters near Kili are rough enough to make food deliveries by ship impossible part of the year. The efforts of the United States to alleviate these problems were often inadequate.⁸²

It was impossible to completely restore Bikini Atoll, as some islands were gone.⁸³ The destruction of large parts of the reef provided an entrance into the lagoon for sharks.⁸⁴ Nevertheless, Bikinians pressed for a return home, and the United States tried to oblige with a \$3 million decontamination effort.⁸⁵ In 1969 Bikinians began returning. However, evidence mounted that radioactivity had saturated the atoll's food chain. By 1977, tests showed an eleven-fold increase in Bikini residents' body levels of cesium-137.⁸⁶ It was determined that ground-water and coconuts, fruit, and vegetables grown there were unsafe for human consumption.⁸⁷ One scientific report stated that Bikini was "possibly the best available source of data for evaluating the transfer of plutonium across the gut wall after being incorporated into biological systems."⁸⁸ A 1978 medical examination revealed that returned Bikinians had internal radiation levels ranging up to approximately twice United States maximum safety standards.⁸⁹ In 1979 the Bikinians were finally re-evacuated to Kili. Current estimates are that their home is-

79 *Id.* at 19. Ronch, *Bikini: Nothing Left to Lose*, *NEW PAC*, Nov.-Dec. 1978, at 12, 12-13. *Swept Away By A Bomb Over Bikini*, *Philadelphia Inquirer*, Dec. 21, 1981, at 1A, col. 1, 11A, col. 2 [hereinafter cited as *Swept Away*].

80 Johnson, *Micronesia*, *supra* note 52, at 10.

81 Pryor, *supra* note 55, at 19.

82 On one occasion, U.S. military planes dropped food from the air. Unfortunately, no one had thought to attach parachutes to the food. Bags of rice which landed on the beach burst open on impact and their contents were mixed with sand. D. Heine, *To Everything There Is a Season*, *MICRONESIAN REP.*, 2d Quarter 1979, at 27, 29.

83 *Bikini Bomb*, *supra* note 62, at 5. Ronch, *supra* note 79, at 15.

84 Ronch, *supra* note 79, at 15.

85 D. McHENRY, *supra* note 38, at 59.

86 Johnson, *Paradise*, *supra* note 52, at 26.

87 *Bikini Bomb*, *supra* note 62, at 5.

88 Johnson, *Paradise*, *supra* note 52, at 26 (quoting *Dose Assessment at Bikini Atoll*, Lawrence Livermore Laboratories, UCRL-51879 (June 8, 1977)).

89 Johnson, *Micronesia*, *supra* note 52, at 15.

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lands will not be habitable for thirty to ninety years.⁹⁰

The experiences of the Enewetakese are similar to those of the Bikinians. They were removed before the tests on their islands and sent to Ujelang, which has one-fourth of the land area and one-fifteenth of the lagoon area of their home atoll. One test in 1952 totally destroyed an island, leaving a one-mile hole in the reef.⁹¹ Long after nuclear testing had stopped there, simulated nuclear blasts with TNT wracked their islands, leaving a crater fifty feet deep and 300 feet in diameter.⁹² Ultimately these tests were halted by a U.S. District Court.⁹³ The United States attempted to clean up Enewetak, at a cost of over \$100 million.⁹⁴ Many Enewetakese have since returned home. Most of the radioactive debris was dumped in a concrete dome on Runit, one of the northern islands in the atoll. Although Runit has been declared off-limits forever,⁹⁵ islands within three miles of it are officially safe for picnics and food gathering.⁹⁶ American scientists have not told Enewetakese what to do about migratory birds and turtles which might have come to the safe islands from Runit.⁹⁷

A 1979 General Accounting Office report indicated that returning Enewetakese could receive radiation doses in excess of current safety standards even if they adhered to suggested living standards.⁹⁸ The report was originally withheld from the Marshallese because of United States concern that it would affect ongoing negotiations over liability and claims.⁹⁹

The loss of land is much more significant in Micronesia than early American test planners realized. Land is scarce in the Trust Territory, which occupies approximately as much area as the continental United States, but has only two-thirds the land mass of Rhode Island.¹⁰⁰ Ownership of land is often a better indication of wealth than money. Land is a guarantee of food and the raw materials needed for housing, transportation (canoes), fishing equipment, and clothing in perpetuity.

90 *Seek Damages From U.S. for 'Loss of Country'*, 67 A.B.A. J. 412, 413 (1981) [hereinafter cited as *Seek Damages*], *Swept Away*, *supra* note 79, at 10A, col. 1.

91 Pryor, *supra* note 55, at 17.

92 D. McHENRY, *supra* note 38, at 59.

93 *People of Enewetak v. Laird*, 535 F. Supp. 811 (D. Hawaii 1973).

94 Thomas, *Nuclear Contamination: 'Not in Our Backyard'*, *NEW PAC.*, Nov.-Dec. 1980, at 28, 30.

95 Johnson, *Paradise*, *supra* note 51, at 24; Thomas, *supra* note 94, at 29. Some writers have estimated that Runit need be off limits for only 24,000 years. Pryor, *supra* note 55, at 22.

96 Johnson, *Paradise*, *supra* note 51, at 24.

97 *Id.*

98 *Id.* at 25 (quoting General Accounting Office, *Enewetak Atoll—Cleaning Up Nuclear Contamination*, PSAID 79-54 (May 8, 1979)). See also G. Johnson, *Plea for Independent Check on Radiation*, *PAC ISLANDS MONTHLY*, August 1979, at 17; Thomas, *supra* note 94, at 30-31.

99 Johnson, *Plea for Independent Check on Radiation*, *supra* note 98, at 17.

100 Boyer, *Micronesia: The Americanization of Eden*, 131 *NAT'L GEOGRAPHIC* 702, 704 (1967).

Money, however, can be lost, squandered, or become worthless as foreign administrations change and the peso is replaced by the mark, which is replaced by the yen, which is replaced in turn by the dollar.

Land ownership is the underlying basis of Micronesian culture, and land is rarely sold. Efforts by the United States to acquire land in the Trust Territory by means other than the creation of a fee simple subject to radiation subsequent usually involve torturous negotiations and often result in litigation. As author Kenneth Brower noted, "Land is the rarest of commodities in Micronesia, and its ownership is at the heart of Micronesian lineage and ranking systems. It is nearly impossible to alienate land in the islands, as numerous foreign administrators have found out."¹⁰¹ While a Micronesian culture could probably survive some radiation injuries, it might not survive loss of a homeland and an accompanying loss of traditional skills and lifestyles.

This points to another possible violation of the Trusteeship Agreement resulting from United States tests. Article VI of the Agreement requires that the United States promote the economic advancement and self-sufficiency of Trust Territory inhabitants.¹⁰² Thirty years of having to choose between living on islands too small to support their populations or eating contaminated food have pushed the Bikinians and Enewetakese away from a lifestyle which was self-sufficient for centuries and towards dependence on United States handouts.

For several years, the United States claimed that only Enewetak, Bikini, and Rongelap were affected by nuclear weapons tests. As noted above, in the mid-1970's Utirik was added to that list. In 1979 a Department of Energy report stated that eleven other atolls or single islands had received intermediate range fallout.¹⁰³ On Ailuk, 250 miles east of Bikini, more than ten percent of the population has developed lime-sized growths on various parts of their bodies.¹⁰⁴ In 1980 the *Micronesian Independent* reported that on Likiep, 300 miles southeast of Bikini with a population of 406, nine women have had babies with severe mental retardation. One woman had three "strange" stillborn babies, "one completely unrecognizable as human." Ten other babies there were abnormal.¹⁰⁵ Throughout the Marshalls, arrowroot, a staple of the Marshallese diet for centuries, is becoming extinct.¹⁰⁶

Lingering radiation may also be responsible for many health

101. K. BROWER, *MICRONESIA: THE LAND, THE PEOPLE, AND THE SEA* 21 (1981).

102. *Trusteeship Agreement*, *supra* note 10, art. 6.

103. Johnson, *Paradise*, *supra* note 51, at 28 (quoting U.S. Department of Energy, *Northern Marshall Islands Radiation Survey* (May 1978)).

104. Johnson, *Marshall*, *supra* note 53, at 17.

105. Johnson, *Paradise*, *supra* note 51, at 28 (quoting *The 25,000 Year Question*, *Micronesian Independent*, June 6, 1980).

106. Johnson, *Marshall*, *supra* note 53, at 17.

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problems attributed to other causes. Radiation reduces the body's supply of new white corpuscles, without which the body is easily overpowered by any common infection.¹⁰⁷ A UN visiting mission to the Marshalls reported in 1956 that the white blood cells of Rongelapese were suppressed to 50% of normal four to six weeks after the Bravo test.¹⁰⁸ As diarrhea and intestinal diseases, pneumonia, and influenza are among the four leading causes of death in Micronesia,¹⁰⁹ any effect that previous or current radiation exposure is having on white blood cells could contribute to apparently non-radiation related deaths.

United States testing on Christmas and Johnston Islands did not conclude until 1962. The wind patterns over those islands are such that fallout would be carried towards the Marshalls.¹¹⁰ Given the results of prior tests, consequences from these tests, if any, would just be starting to manifest themselves. In 1979 it was claimed that missiles being shot into Kwajalein Atoll, site of a United States tracking station, contained uranium. A Marshallese government source claimed that as a result the lagoon's uranium levels exceeded U.S. Environmental Protection Agency limits.¹¹¹ These new threats, combined with lingering radiation elsewhere and the possibility of genetic damage, indicate that the material above might require constant updating.

The United States Congress has passed three statutes appropriating compensation for affected Marshallese.¹¹² Various compensation schemes have ranged from insultingly low¹¹³ to \$100,000 for the family of the Rongelapese leukemia victim.¹¹⁴ Marshallese generally feel that they are receiving less than they would have if they had been Americans living near Nevada testing ranges,¹¹⁵ and are seeking additional compensation in American courts.¹¹⁶ Marshallese and American negotiators have recently agreed to a settlement in which the United States

107 W. SHURCLIFF, THE OFFICIAL REPORT OF OPERATION CROSSROAD 142 (1947).

108 D'Amato, *Legal Aspects of French Nuclear Tests*, 61 AM. J. INT'L L. 66, 74-75 (1967) (referring to Report of the United Nations Visiting Mission to the Trust Territories in the Pacific 1956, U.N. Trusteeship Council, Official Records, 18th Sess., Supp. No. 3 (T/1278), at 26-28, 45).

109 UNITED STATES DEPARTMENT OF STATE, 34TH ANNUAL REPORT TO THE UNITED NATIONS ON THE ADMINISTRATION OF THE TRUST TERRITORY OF THE PACIFIC ISLANDS 114 (1981).

110 Johnson, *Marshall*, *supra* note 53, at 17.

111 *Occupying Kwajalein*, PAC. ISLANDS MONTHLY, Sept. 1979, at 9.

112. An Act to Authorize Appropriations for Certain Insular Areas of the United States, Pub. L. No. 96-205, 94 Stat. 84 (1980); An Act to Authorize Appropriations for the Territories of the United States, Pub. L. No. 95-134, 91 Stat. 1159 (1977); An Act to Provide for the Settlement of Claims of Certain Residents of the Trust Territory of the Pacific Islands, Pub. L. No. 88-485, 78 Stat. 598 (1964). See also Sicard, *supra* note 52.

113. One compensation plan paid Bikinians less than \$80.00 apiece for use of their land and established a trust fund which paid them \$16.75 twice a year. Ronch, *supra* note 79, at 15.

114 Pryor, *supra* note 55, at 18-19.

115. *Id.* at 23.

116. See *Seek Damages*, *supra* note 90; *Pacific Islands Sue the U.S. for \$500 Million*, N.Y. Times, Oct. 17, 1982, § 1, at 7, col. 2.

will officially recognize its responsibility for the consequences of the nuclear weapons tests and establish a \$150 million trust fund for the islanders. The fund is expected to produce over \$180 million in income over the next fifteen years. After fifteen years, three-quarters of the trust income will be set aside in perpetuity for claims that may arise, with the remaining one-quarter used for medical and other services. An additional \$47.5 million will be made available to cover any further personal injury claims against the United States, with such claims being decided by a special tribunal. As part of this agreement, Marshallese will drop the above-mentioned lawsuits, in which they are seeking damages totalling over four billion dollars. The agreement must be approved by a referendum in the Marshall Islands, the United States Senate, and the United Nations Security Council.¹¹⁷ In evaluating past and proposed compensation schemes, it must be remembered that those islanders who lost land are seeking compensation for loss of a perpetual supply of life's necessities. Those who were exposed to radiation may be seeking compensation for future generations of harmed individuals.

Debate continues as to whether the plight of the Marshallese is the result of a deliberate experiment or a continuing series of military, scientific, and medical errors. Many in the Pacific believe the former.¹¹⁸ These beliefs are supported by statements, admittedly often taken out of context, of American military and scientific personnel.¹¹⁹ Problems with the United States medical program and United States resistance to independent scientific investigation and medical treatment have convinced many Marshallese that they are guinea pigs, rather than patients.¹²⁰ Whatever the factual answer to this debate may be, any

117. Maass, *U.S., Islanders Reach Pact on A-Test Damages*, Washington Post, June 28, 1983, at A2, col. 3.

118. See, e.g., H. WASSERMAN & N. SOLOMON, *supra* note 44, at 86 (quoting Rongelapese), Johnson, *Marshall*, *supra* note 53, at 16 (quoting Utrikese letter to Atomic Energy Commission). See also *Danger of Fallout Said Known*, *supra* note 44, at 2, col. 5. Many Americans living near testing sites in the American West have similar beliefs. See *The West: A Secret Lethal Lab*, Chi Tribune, April 1, 1979, at 1, col. 2.

119. E.g., THE EFFECTS OF NUCLEAR WEAPONS § 11.149 (S. Glasstone ed. 1964) (prepared by U.S. Department of Defense, published by Atomic Energy Commission) (explains why cultural and climatological factors made Marshallese valuable research subjects), W. SHURCLIFF, *supra* note 107, at 3, 4, 7, 16 (medical research goals of Operation Crossroads) (inadequacy of research at Hiroshima and Nagasaki) (possibility that fallout could injure persons within 300 miles of test site), Johnson, *Paradise*, *supra* note 51, at 28 (quoting Admiral Lewis Strauss of Atomic Energy Commission on return from Bikini in 1954: "[A]t no time was the testing out of control. . . . No test is made without a definite purpose and a careful determination that is directed to an end result of major importance.")

120. See Political Status Commission of the Marshall Islands, 1976 *Interim Report* 23, reprinted in *Current Problems in the Marshall Islands: Hearings Before the Subcomm. on Territorial Affairs of the House Comm. on Interior and Insular Affairs*, 94th Cong., 2d Sess. 95, 107 (1976) ("Because of the AEC's initial role in conducting the tests and ERDA's continuing role as a proponent of plutonium (the primary contaminating material at Bikini and Eniwetok) as a fuel for electrical generation, the Bikini people testified they are unwilling to rely on analysis by ERDA or

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future potential nuclear users of the ocean face the double burden of convincing Pacific governments of both their competence and their good intentions.

At the time McDougal and Schlei's security interests bowled over various straw men, they were relying on limited data. The AEC had reported soon after the Bravo test that no Marshallese had suffered radiation burns and all were well.¹²¹ The American administrator of the Marshalls had gathered indigenous leaders together shortly after the test and warned them that "whosoever breathed a word of the incident would be shot before sunrise."¹²² It is possible that if McDougal and Schlei were to revise their article in light of information that has since become available, they would reconsider their verdict of reasonableness. Unfortunately, the "balancing" and "reasonableness" rationales they developed were echoed, sometimes without citation and perhaps sometimes with distortion, as justifications for further United States tests,¹²³ for the *Pauling* court's refusal to enjoin the tests at issue, and for the later French tests.

It is also possible that a "balancer" might weigh the long-term results of the tests against United States security interests and still consider the tests legal. McDougal and William T. Burke, Professor of Law at the University of Washington, noted that the tests "have been carried out in parts of the sea far removed from populations of any appreciable magnitude."¹²⁴ It is possible that a balancer could weigh the welfare of unappreciated Marshallese against the harm that would be caused by an undeterred Soviet Union. Similarly, even if one completely accepted the charges that the United States deliberately experimented on the Marshallese, the evils of performing harmful experiments on innocent persons could be balanced against, and outweighed by, perceived security benefits. If the study of radiation victims yields valuable military data regarding the composition of the bomb that harmed them or the effects radiation would have on soldiers, any right exposed Marshallese have to independent and accurate scientific and medical advice could lose a balancing test against the need to prevent leaks of security-

former AEC scientists of data from radiation surveys."), *ERDA's Medical Program Criticized*, GILBERTS, 4th Quarter 1977, at 20; Johnson, *Marshall*, *supra* note 53, at 16, 18; Johnson, *Micronesia*, *supra* note 52, at 12, 13 (letter from Rongelapese magistrate) (U.S. finally allowed independent doctors to accompany AEC team after Rongelapese refused to undergo 1972 examinations).

121 R. LAPP, *supra* note 35, at 53. *Contra* THE EFFECTS OF NUCLEAR WEAPONS, *supra* note 118, at 603-06 (U.S. government publication containing pictures of Marshallese with radiation burns, although burns may not have developed until after the AEC statement).

122 D. HEINE, *supra* note 82, at 29.

123 C. Doyle, *Radioactive Waste Disposal Mobility and Freedom for Nuclear Vessels*, JAG J., April 1959, at 12, 14 (U.S. official at Geneva Conference on the Law of the Sea took position that U.S. testing on high seas was reasonable, and therefore legal).

124 M. McDougal & W. Burke, *THE PUBLIC ORDER OF THE OCEAN* 772 (1962).

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related information.¹²⁵ However, this still leaves open the question of why the Marshallese had to bear such a disproportionate share of the costs of deterring Russia.¹²⁶ Therefore, not only must the lives, property, and health of the Marshallese be balanced against the temporary security interests of the United States, they must also be balanced against the lives, property, and health of any other population group. McDougal felt that it was not unreasonable for the United States to test "in preparation for the defense of . . . all the values of a free world society."¹²⁷ One must wonder if it is "reasonable" to protect free world values by engaging in balancing tests which require the adoption of values more closely associated with free world opponents.

Evidence mounted that the fallout from nuclear testing affected not just persons within a few hundred miles of the test sites, but instead was causing a measurable increase in atmospheric radiation with harmful consequences worldwide.¹²⁸ In 1963, the United States became a party to the Treaty Banning Nuclear Weapons Tests in the Atmosphere, in Outer Space, and Under Water of August 5, 1963.¹²⁹ The treaty's title is self-explanatory, and the United States abided by its terms and stopped testing in the Pacific. As of 1980, 110 states were parties to this treaty. France has never signed the treaty.

B. *French Tests in Polynesia*

The next major dispute related to nuclear activity in the Pacific involved above-ground French nuclear tests in Polynesia. France began its nuclear testing in Algeria, but had to find a new site for several reasons. First, Algeria became independent. Next, fallout from an Algerian test had blown across the Mediterranean to Europe.¹³⁰ Finally, France may have been influenced by United Nations General Assembly resolutions calling for the cessation of nuclear weapons tests in Africa.¹³¹ The decision was made to relocate the tests in French Polynesia on the island of Moruroa.

125 Cf. R. LAPP, *supra* note 35, at 148 (U.S. refusal to supply information to Japanese doctors treating fishermen injured by Bravo's fallout).

126 This question remains open even if it is assumed that Micronesians also benefited from having Russia deterred, an assumption which would probably be correct. The costs born by a few hundred or thousand Marshallese would still be disproportionate when compared to those born by the several million citizens of the U.S. and other countries under the umbrella of U.S. nuclear protection.

127 McDougal, *The Hydrogen Bomb Tests and International Law of the Sea*, 49 AM. J. INT'L L. 356, 361 (1955).

128 H. WASSERMAN & N. SOLOMON, *supra* note 44, at 92-110.

129 14 U.S.T. 1313, 408 U.N.T.S. 43.

130 G. Johnson, *Testing La Bombe in French Polynesia*, NEW PAC., Nov.-Dec. 1980, at 22 [hereinafter cited as Johnson, *Testing*].

131 Goldie, *The Nuclear Test Cases: Restraints on Environmental Harm*, 5 J. MAR. L. & COM. 491, 497 (1973-74).

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While the United States generally tried to at least create an impression of concern for world opinion and the welfare of indigenous inhabitants, France, perhaps more honest rather than less humanitarian, had little concern for such niceties. The French ignored protests from both elected and traditional island leaders, protests which echoed the sentiments of nearly the entire Polynesian population.¹³² Shortly before the tests began in 1966, France declared a danger zone. When it was pointed out that the zone included seven inhabited atolls, the zone, but apparently not the yield of the bombs, was reduced so that it included only one, Tureia.¹³³ In 1966 the French government assured a member of the Polynesian Territorial Assembly that all migratory fish sold in the major fish market on Papeete would be checked for radioactivity. This checking was never done.¹³⁴ When the people of Tureia were evacuated shortly before a series of tests in 1968, the French explanation was that the entire population of the atoll was very patriotic and had asked the French government for transportation to Bastille Day festivities on Tahiti.¹³⁵

In 1966 General DeGaulle visited Moruroa to observe a test. On the scheduled test date the wind was blowing toward several inhabited areas, including Samoa, Fiji, and the Cook Islands. The test was postponed. The following day wind conditions were the same, but DeGaulle was in a hurry to return to Paris. Therefore, the tests proceeded as scheduled, resulting in fallout upon the above-mentioned islands.¹³⁶

France claimed that the tests were safe, but refused to release any health or environmental data, and also refused to allow investigation by independent scientists or physicians.¹³⁷ Meanwhile, scientists elsewhere claimed that the French tests were responsible for an increasing level of radioactivity in fish caught off the coast of Mexico and a five-fold increase in the radioactivity of rainwater in Fiji.¹³⁸

With America no longer testing above ground or outside its own territory, France filled a void for scholars. Prior to the commencement of legal French testing, freedom of the seas had been codified in article II of the Convention on the High Seas of April 29, 1958.¹³⁹ It stated that this freedom was comprised, "inter alia," of freedom of navigation, fishing, the laying of submarine cables and pipelines, and flight over

132. D'Amato, *supra* note 108, at 67; Johnson, *Testing*, *supra* note 130, at 22.

133. Johnson, *Testing*, *supra* note 130, at 22.

134. *Id.* at 23.

135. *Id.* at 25.

136. *Id.* at 22-23.

137. *Id.* at 25.

138. *Id.*

139. 450 U.N.T.S. 82, 13 U.S.T. 2312.

the high seas. Article II further said that these freedoms, and "others which are recognized by the general principles of international law, shall be exercised by all States with reasonable regard to the interests of other States in their exercise of the freedom of the high seas." This, of course, provided legal scholars the opportunity to debate the meanings of terms such as "inter alia," "others," and "reasonable."¹⁴⁰

The debate followed the lines of the earlier debate on similar issues in regard to United States tests, but this time the consensus, at least in English-language legal periodicals, was much more solidly against the legality of testing. This was due in part to a better understanding of the effect upon fisheries.¹⁴¹ Arguments based on the *Trail Smelter* case,¹⁴² Article 73 of the United Nations Charter,¹⁴³ and the Genocide Convention¹⁴⁴ resembled those made about American tests. Scholars now had the opportunity to debate whether or not the Test Ban Treaty was customary law.¹⁴⁵ The absence of a convincing security rationale for French testing convinced most writers that these tests should be distinguished from those conducted by the United States on the grounds that the French tests could not be justified as necessary for world security. France was not the sole agent for one side in a global bipolar nuclear balance of terror.¹⁴⁶ The strongest support that France received in an English-language legal periodical may have come from Mercer. He described the French tests as "reprehensible," "heartless," and "immoral," but "not illegal," largely because the possible critical health risks had not yet materialized.¹⁴⁷

Anthony A. D'Amato, Instructor in Political Science at Wellesley College, proclaimed his support of McDougal and Schlei's theories and the previous United States tests. Nevertheless, he rejected arguments in favor of French testing. One such argument was that the tests would restore France's prestige in the eyes of the world. Terming this the "grandeur" argument, D'Amato noted that the tests brought France worldwide condemnation rather than grandeur.¹⁴⁸ He also commented

140. See, e.g., Comment, *Explosive Issue*, *supra* note 26, at 302-04 (High Seas Convention does not make all nuclear testing illegal *per se*, but France has crossed line into unreasonable interference with High Seas freedoms); Mercer, *supra* note 27, at 405-08 (France has not violated High Seas Convention).

141. See, e.g., Mercer, *supra* note 27, at 407.

142. Comment, *Explosive Issue*, *supra* note 26, at 298; Mercer, *supra* note 28, at 419.

143. D'Amato, *supra* note 108, at 72; Mercer, *supra* note 28, at 419.

144. D'Amato, *supra* note 108, at 75-76.

145. *Id.* at 68; Mercer, *supra* note 28, at 420.

146. D'Amato, *supra* note 108, at 70-71, 75-76.

147. Mercer, *supra* note 28, at 421. Assume that thalidomide has been banned from country X because it had produced birth defects there. Applying Mercer's logic, if thalidomide is then introduced into country Y a few years later, it may not be banned there until the possible critical health risks materialize nine months later.

148. D'Amato, *supra* note 108, at 69.

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that if France's actions encouraged other nations to develop nuclear arsenals, this would bring grandeur to none but insecurity to all.¹⁴⁹ He then turned to France's argument that France could not rely on United States protection and needed its own nuclear deterrent. D'Amato suggested that France was probably not capable of developing an arsenal which would effectively deter Russia, but might be able to develop one which would encourage the Soviets to rely on a preemptive nuclear first strike rather than conventional military forces if hostilities did break out between the two countries.¹⁵⁰ After reviewing the then available data on the effects of United States testing in the Marshalls, D'Amato stated, apparently with no irony intended, the following:

Because France has neither the technical experience of the United States nor the financial resources which may be devoted to safe-guarding the test sites, it may well be argued that the French tests constitute at least as great, and perhaps a greater threat to the people of Polynesia than those of the United States constituted to the Marshall Islanders.¹⁵¹

France continued testing, ignoring protests from Australia, the Cook Islands, Nauru, Fiji, Tonga, Chile, Western Samoa, Peru, the United States and Britain.¹⁵² In 1973 the Australian Academy of Scientists reported that French tests could cause 1000 deaths and disabilities in subsequent generations of Australians, including ten cases of thyroid cancer and many cases of other forms of cancer.¹⁵³ Without pausing to determine if this harm would be reasonable under a McDougal-Schlei balancing test, Australia and New Zealand brought suit in the International Court of Justice seeking to enjoin the tests. The Australian and New Zealand claims were based on the following:

- 1) a right of all states to be free from nuclear weapons tests conducted

149 *Id.*

150. *Id.* at 69-70. The French government disagreed with this criticism. See Ambassade de France, Service de Presse et D'Information, Excerpts From the Address by French Premier Jacques Chirac Before the French Senate 4 (June 10, 1975) (France is third-ranking nuclear power in the world, with arsenal sufficiently diversified and developed to constitute a major threat to a potential aggressor).

151. D'Amato, *supra* note 108, at 74.

152. See D'Amato, *supra* note 108, at 66-67; Johnson, *Testing*, *supra* note 130, at 25; Comment, *Explosive Issue*, *supra* note 26, at 304.

153. Comment, *Explosive Issue*, *supra* note 26, at 297. Some scientists disputed this conclusion. See *The International Court of Justice The Nuclear Test Cases: Judicial Silence v. Atomic Blasts*, 16 HARV. INT'L L.J. 614, 620 (1975) [hereinafter cited as *Judicial Silence*]. The French government claimed that the tests were absolutely safe, and that their safety had been verified by the United Nations Scientific Committee. Ambassade de France, Service de Presse et D'Information, Address by His Excellency Jean Sauvagnargues, French Minister of Foreign Affairs Before the 29th Session of the United Nations General Assembly, 8 (Sept. 23, 1974); Ambassade de France, Service de Presse et D'Information, French Nuclear Tests in the Pacific Communiqué from the Office of the President of the Republic 1 (June 8, 1974). Phillipines Foreign Secretary Carlos P. Romulo suggested that if the tests were as safe as France claimed they should be held as tourist attractions on the French Riviera. *Romulo Challenges France*, N.Y. Times, Sept. 16, 1973, at 4, col. 1.

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- by any state, by virtue of a customary rule of law based on the Test Ban Treaty, United Nations resolutions, and other sources;
- 2) a right, inherent in their sovereignty, not to be subjected to deposits of fallout in their territory and dispersion of fallout in their air-space; and
 - 3) a right to have France respect freedom of the high seas, by not interfering with freedom of navigation and passage through air-space and by not polluting the high seas.¹⁵⁴

France's position was that Australia and New Zealand had not suffered any legally recognizable damage. Neither, claimed France, had they shown any violation of any legal norms concerning the threshold which atomic pollution should not exceed, nor had they established that nuclear testing is automatically unlawful.¹⁵⁵

However, France chose to proceed in the International Court of Justice solely by attacking the court's jurisdiction. The court has jurisdiction over states to the extent which they have submitted to its jurisdiction in declarations, made pursuant to article 36 of the Statute of the International Court of Justice,¹⁵⁶ recognizing the court's jurisdiction. Prior to the Nuclear Tests cases, France had been a party plaintiff and party defendant in more proceedings before the International Court of Justice and its predecessor, the Permanent Court of International Justice, than any other state. Nevertheless, France refused to appoint an agent to represent it before the court in these cases, and refused to become a party to the proceedings. Before judgment was rendered, it withdrew its acceptance of the court's compulsory jurisdiction.¹⁵⁷ Despite this withdrawal, on June 22, 1973, without prejudging the merits, the International Court of Justice issued interim orders instructing France to avoid nuclear tests causing the deposit of radioactive fallout on Australian or New Zealand territory.¹⁵⁸ Less than a month after the International Court of Justice orders, France began a new series of tests. This controversy, of course, provided fuel for more legal commentary.

S. Azadon Tiewul, a doctoral candidate at Harvard Law School and former Associate Research fellow at the Center for International Studies, reexamined the McDougal-Schlei reasonableness tests. He stated that because nuclear tests completely obstruct all other uses of the

154. Nuclear Tests (Australia v. France), 1973 I.C.J. 99, 103 (Interim Protective Order of 22 June 1973); *Judicial Silence*, *supra* note 153, at 631-32.

155. Goldie, *supra* note 131, at 498-99.

156. 1977 Yearbook of the United Nations 1190.

157. See J. SWEENEY, C. OLIVER & N. LEECH, *THE INTERNATIONAL LEGAL SYSTEM* 54-71 (2d ed. 1981) (general discussion of I.C.J. jurisdiction and cases involving France).

158. Nuclear Tests (Australia v. France), 1973 I.C.J. 99 (Interim Protective Order of 22 June 1973); Nuclear Tests (New Zealand v. France), 1973 I.C.J. 135 (Interim Protective Order of 22 June 1973).

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ocean, one cannot determine the reasonableness of testing by balancing them first against fishing, then against navigation, etc. Instead, he felt they should be balanced in one single computation against the sum total of all other possible ocean uses. Under this new formula, he decided that testing on the high seas was illegal.¹⁵⁹

One commentator concluded that the value to international security of French tests "is at best non-existent and is more probably negative."¹⁶⁰ He noted that the tests were a serious source of friction between France and Pacific states. Furthermore, the danger of a catastrophic nuclear accident would be greater in a multi-power system than in a bipolar system. Finally, the French tests provided impetus and justification for other nations of a similar size or position to create their own independent nuclear force, either as a perceived military necessity or as a symbol of prestige.¹⁶¹

L.F.E. Goldie, Director of the International Legal Studies Program at Syracuse University, suggested that the French tests, by forcing other states to accept the policies and budgetary priorities needed to respond to pollution, could violate article 2 of the United Nations Charter, which states, "All members shall refrain in their international relations from the . . . use of force against the territorial integrity . . . of any state."¹⁶² He interpreted the International Court of Justice orders as establishing that a state claiming injury from radioactive fallout would not have to carry the difficult burden of having to prove that the nuclear tests complained of crossed some forbidden threshold.¹⁶³ Goldie also concluded that the International Court of Justice orders established that an offending state cannot earn the right to continue its violations by paying compensation.¹⁶⁴ He recommended that the International Court of Justice establish a regime in which testing would be prohibited altogether or permitted only up to indubitably safe levels.¹⁶⁵

159. Tiewul, *International Law and Nuclear Test Explosions on the High Seas*, 8 CORNELL INT'L L.J. 45, 47 (1974).

160. Comment, *French Nuclear Tests: A Crisis for International Law*, 4 DEN. J. INT'L L. & POL'Y 111, 121 (1974) [hereinafter cited as Comment, *French Tests*].

161. According to 1980 population estimates, the following nations were among those with populations larger than France: Bangladesh, Brazil, Indonesia, Japan, Mexico, and Nigeria. The following nations were among those with populations at least 70% as large as France: Iran, South Korea, Philippines, Thailand, Turkey, and Vietnam. See WORLD ALMANAC BOOK OF FACTS 497-598 (H. Lane ed. 1982). If "position" as well as size is considered, many of these nations currently have more security problems than France. However, as D'Amato noted, by signing the Test Ban Treaty, most nations indicated that they did not feel a need to protect themselves with atmospheric tests. D'Amato, *supra* note 108, at 68.

162. Goldie, *supra* note 131, at 503.

163. *Id.* at 504.

164. *Id.* at 505.

165. *Id.* at 505.

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Legal scholars were increasingly prepared to accept the Test Ban Treaty as customary international law, especially in view of overwhelmingly approved United Nations resolutions on nuclear proliferation and the environment, the advent of the disarmament decade, and various treaties dealing with non-proliferation.¹⁶⁶ One writer suggested that the policy against atmospheric testing might be approaching the level of *jus cogens*.¹⁶⁷

Protests against France mounted. The governments of Argentina, Australia, Canada, India, Indonesia, Japan, Malaysia, New Zealand, Peru, the Philippines, Singapore, and South Vietnam voiced varying degrees of displeasure, with Peru going the farthest by breaking off diplomatic relations with France.¹⁶⁸ An editorial in the *Far Eastern Economic Review* probably reflected the views of many Asians and Pacific islanders when it stated French actions were based on the old colonial belief that "life is cheap" in non-Western lands. The editorial accused France of ignoring its tradition of respect for law by disregarding the International Court of Justice orders. It concluded, "[A] colonial hypocrisy characterizes the French rationale for the tests—the massive series of devices triggered by the Russians and the Americans and the British during the Cold War. Paris solemnly pretends that nothing has changed since—no non-proliferation treaty, no SALT"¹⁶⁹

The French people did not unanimously endorse their government's nuclear policies. High ranking Roman Catholic prelates in France opposed the testing,¹⁷⁰ and François Mitterand, the runner-up in the 1974 French presidential elections, was also against the tests.¹⁷¹

At first the official French reaction to the protests against its 1973 tests was characteristic of the way the testing program had previously been conducted. Foreign Minister Michel Jobert declared that the protests "will not prevent me from sleeping well at night" and concluded, "[T]his fuss is running out of breath and will die in the face of France's

166 Tiewul, *supra* note 159, at 58; Comment, *French Tests*, *supra* note 160, at 113, 115, 123.

167 Comment, *International Court of Justice Has Preliminary Jurisdiction to Indicate Interim Measures of Protection: The Nuclear Test Cases*, 7 N.Y.U. J. INT'L L. & POL'Y. 163, 175 (1974) "Jus Cogens" refers to a preemptory norm of general international law, accepted and recognized by the international community of States as a whole as a norm from which no derogation is permitted and which can be modified only by a subsequent norm of general international law having the same character. Vienna Convention on the Law of Treaties, opened for signature May 22, 1969, art. 53, U.N. Doc. A/Conf. 39/27.

168. Wain, *La Bombe: Asia and French Phlegm*, FAR E. ECON. REV. [Far Eastern Economic Review], July 30, 1973, at 12.

169 Editorial, *French Filth*, FAR E. ECON. REV., July 30, 1973, at 11.

170 *French Clergy, Army Clash Over A-Tests*, N.Y. Times, July 18, 1973, at 1, col. 4.

171. *French Plan Final Series of A-Tests in Atmosphere*, N.Y. Times, June 9, 1974, § 1, at 1, col.

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determination to ensure its own defense."¹⁷² France conducted another series of tests in violation of the Interim Orders in 1974.¹⁷³ Reform Minister Jean-Jacques Servan-Schreiber was dismissed by President Valéry Giscard d'Estaing for holding a news conference to denounce the decision to proceed with the 1974 test.¹⁷⁴

Finally, however, with a final International Court of Justice decision approaching, France announced that it would cease atmospheric testing and shift to underground testing on Moruroa and Fangataufa. France claimed that this decision was simply the result of French technological advances. One French legal scholar, Pierre Lellouche, a doctoral candidate at Harvard Law School, noted the higher costs of underground tests and suspected that international pressure was a major factor in the shift.¹⁷⁵ The International Court of Justice interpreted France's declarations as binding legal obligations and determined that the Australian and New Zealand claims were moot.¹⁷⁶ In a separate opinion, Judge Gros outlined France's now-irrelevant legal justifications.

Gros claimed that Australia was making a political move with no legal basis.¹⁷⁷ He claimed that Australia was estopped from asserting its claim because of its active cooperation with United States and United Kingdom tests in the Pacific.¹⁷⁸ He asserted that the principle of sovereign equality gave France the same current right to test which the United States previously had.¹⁷⁹ He stated that previous Australian radiation studies had shown that the French tests were unlikely to result in significant health hazards for the Australian population,¹⁸⁰ and claimed that the three nuclear powers which were original parties to the Test Ban Treaty did not interpret it as imposing a legal norm on non-parties.¹⁸¹ Gros cited the American *Pauling* case to support the legality of atmospheric nuclear tests.¹⁸²

The French finally received support in an English-language legal pe-

172 Wain, *supra* note 168, at 13.

173 Khosla, *Nuclear Test Cases: Judicial Valour v. Judicial Discretion*, 18 INDIAN J. INT'L L. 322, 328 (1978).

174 Giscard Dismisses Servan-Schreiber in *A-Test Dispute*, N.Y. Times, June 10, 1974, at 1, col. 4.

175 *Judicial Silence*, *supra* note 153, at 635-36.

176 *Nuclear Tests (Australia v. France)*, 1974 I.C.J. 253 (judgment of 20 Dec. 1974); *Nuclear Tests (New Zealand v. France)*, 1974 I.C.J. 457 (judgment of 20 Dec. 1974).

177. 1974 I.C.J. at 276-80 (Gros, J., separate opinion).

178. *Id.* at 280-82. In New Zealand's case, Judge Gros had to substitute "support" for active cooperation. 1974 I.C.J. at 481 (Gros, J., separate opinion). Gros appears to conform to the view of the French government taken by the editors of the *Far Eastern Economic Review* in that he pretended nothing had changed since those earlier tests. See Editorial, *supra* note 169, at 11.

179. 1974 I.C.J. at 284-85 (Gros, J., separate opinion).

180. *Id.* at 285.

181. *Id.* at 287.

182. *Id.* at 298 n.1.

riodical in an article written by Lellouche shortly after the International Court of Justice decisions. Lellouche primarily elaborated on theories raised in Gros's opinion. However, in expanding on the sovereign equality argument he came close to exposing its foolishness. Lellouche noted that the United States and USSR had each conducted over 150 atmospheric tests, while France had conducted only forty-seven. Therefore, if France were required to stop testing, it would be penalized simply because it was late in developing its nuclear programs by comparison with the United States and USSR.¹⁸³ In short, Lellouche seems to be saying that the principle of sovereign equality requires that every nation be allowed to conduct over 150 atmospheric nuclear tests. While some nations, perhaps Upper Volta or Nauru, might not use their full quota, anything remotely approximating full exercise of this claimed legal right would entail well over 10,000 atmospheric nuclear tests. One must wonder about the wisdom of a rule of international law that creates a legal right which, if exercised, would probably make the Earth uninhabitable.

The French testing shifted underground despite warnings from one French volcanologist that the rocks in Fangataufa Atoll were so porous and lacking in shock resistance that there was a risk of radioactive leakage.¹⁸⁴ In 1979, a bomb became wedged 2800 feet down in a 4200 foot shaft on Moruroa. Unable to dislodge it, the French exploded it where it was. Within hours of the blast, a tidal wave struck Moruroa, overturning vehicles and injuring people. French spokesmen originally expressed their surprise at this strange coincidence but finally admitted that the blast had caused the wave.¹⁸⁵

In addition to underground tests, the French government conducted detonation experiments in concrete bunkers on the surface of Moruroa. Critics claimed that these experiments released unknown quantities of plutonium into the environment. On one occasion in 1979 a crew of decontaminators accidentally ignited gas in one of the bunkers. Two of the decontaminators were killed and the other four were injured in the resulting explosion. The French government claimed that the accident was chemical and not nuclear, but refused to release any other information which would reveal how much, if any, plutonium was released in this accident.¹⁸⁶

France continues to refuse to release scientific reports of test results or permit independent monitoring of the Polynesian people and their

183 *Judicial Silence*, *supra* note 153, at 632

184 Johnson, *Testing*, *supra* note 130, at 27.

185 *Accidents on Moruroa*, PAC ISLANDS MONTHLY, Oct. 1979, at 23 [hereinafter cited as *Accidents*]; G. Johnson, *Moruroa Accidents*, NEW PAC., Nov.-Dec. 1980, at 24 [hereinafter cited as Johnson, *Moruroa*].

186 *Accidents*, *supra* note 185, at 23; Johnson, *Moruroa*, *supra* note 185, at 24

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environment.¹⁸⁷ A nurse on Mangareva, 150 miles east of Moruroa, reported an unusual number of miscarriages among women there.¹⁸⁸ Given the Utiirikes experience, a full assessment of the effects of French testing probably cannot be made before the end of the decade. Nevertheless, as journalist Giff Johnson has commented, if the tests are harmless, it would be in France's favor to publish scientific data showing that no health hazards have yet resulted. As Johnson also noted, no such data has yet been published.¹⁸⁹

In 1981 France announced that it was considering moving its tests from Polynesia to the Kerguelen Islands in the Indian Ocean. These islands are near the Australian territories of Heard and McDonald, and close to international shipping lanes between Cape Town and Perth.¹⁹⁰ This will move the tests further away from indigenous Pacific populations, but memories of the French tests will remain. American testing caused Pacific islanders to mistrust both anything nuclear and outside imposition of norms for controlling, or justifying, nuclear pollution. French testing deepened this mistrust. Japan would soon discover its intensity.

III. THE LONDON CONVENTION AND THE DISPUTE OVER JAPANESE DUMPING PLANS

In 1980 Japan announced plans to dump 10,000 drums of low-level nuclear wastes in the Pacific at a site 400 miles east of its own Bonin Islands and 560-600 miles north of the Commonwealth of the Northern Marianas (CNM). Hoping to avoid the acrimony which accompanied France's nuclear activities in the Pacific, and displaying greater sensitivity than previous nuclear users of the ocean, Japan sent a team of officials and scientists to tour various Pacific states and territories to discuss these plans. They may have hoped for a relaxing South Pacific junket, as they were going to inform islanders that the Japanese dumping plans complied fully with the London Convention,¹⁹¹ a treaty developed primarily by continent-based powers to legitimate ocean dumping of nuclear wastes while providing some measure of protection to the marine environment. Instead, the Japanese team was met with heated protests which eventually caused Japan to abandon its plans.

187 Johnson, *Testing*, *supra* note 130, at 27. France has recently said that it would finally allow scientists from South Pacific nations to examine the test sites in Polynesia. *French Nuclear Test Site*, Washington Post, June 21, 1983, at A15, col. 2.

188 Johnson, *Testing*, *supra* note 130, at 27.

189 *Id.*

190 *France May Shift Test Site*, Philadelphia Inquirer, December 21, 1981, at 10A, col. 2. The tests have not yet been moved. In the meantime, France has tested a neutron bomb on Moruroa. *Hernu France Tested Neutron Weapon*, Washington Post, June 28, 1983, at A9, col. 1.

191 Convention on the Prevention of Marine Pollution by Dumping of Waste and Other Matter, Dec. 29, 1972, 26 U.S.T. 2403, T.I.A.S. No. 8165.

A. The London Convention

Radioactive wastes are an unavoidable by-product of the operation of nuclear power reactors. Disposal of these wastes at sea results in both environmental hazards and political benefits. The London Convention was an effort to provide a legal regime legitimizing ocean disposal of nuclear wastes, thereby securing the political benefits, while lessening the environmental hazards.

The hazards associated with ocean dumping of nuclear waste include those discussed earlier for other means of radiation exposure. Their effects upon fish include reduction in reproductive capability, morphological abnormalities, leukopenia, anorexia, lethargy, growth depression, and hyperactivity.¹⁹² Radioactive wastes are classified as high-level wastes and low-level wastes. While exact definitions vary, those terms are fairly self-explanatory. Some high-level wastes may require isolation from the biosphere for hundreds of thousands of years,¹⁹³ and even certain low-level wastes require isolation for just as long.¹⁹⁴ Once these wastes enter the marine food chain, radioactivity will work its way up the chain to man.¹⁹⁵ After being dumped in the ocean, these wastes cannot be retrieved except at great cost. However, ocean dumping does have one overwhelming political advantage for nuclear powers. It spares politicians from the political risks involved in choosing a disposal site within their own territory.

The inadequacies of existing international law in dealing with the environmental risks became readily apparent. Nations once had absolute freedom to dump radioactive wastes at sea. From 1946-70, the United States dumped 86,758 containers of low-level wastes into the ocean. Radioactive leakage from all of the United States dumpsites has exceeded anticipated levels.¹⁹⁶ Korea, Japan, and some European nations have also dumped nuclear wastes in the ocean.¹⁹⁷ The High Seas Convention limited this freedom, as article 25 required states to take measures to prevent ocean pollution from radio-active dumping, taking into account standards and regulations formulated by competent international organizations. The freedom to dump may also be limited by the extent to which dumping interferes with article 2's guarantees of

192. Lomio, *International Law and Disposal of Radioactive Wastes at Sea*, 15 NEW ENG. L. REV. 253, 260 (1979-80).

193. *Id.* at 255 ("at least hundreds of thousands of years"); Note, *Disposal of Nuclear Waste: An Abidation of Responsibility?* 1979 U. ILL. L.F. 915, 916 ("up to 250,000 years").

194. Lomio, *supra* note 192, at 256.

195. *Id.* at 260-61.

196. *Id.* at 257.

197. Handl, *Managing Nuclear Waste: The International Connection*, 21 NAT. RESOURCES J. 268, 300 (1981).

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other freedoms of the high seas.¹⁹⁸

Much clearer standards for ocean dumping were developed in 1972 in the London Convention. The treaty applies to all but internal waters. It generally prohibits ocean dumping of high-level wastes. The dumping of low-level wastes is permitted, but dumping parties are required to obtain permits from a contracting state. The state considers such matters as composition of the waste, the method of disposal, the impact upon competing ocean uses, availability of alternative land-based disposal methods, and recommendations of competent international bodies in determining whether to issue a permit.¹⁹⁹ As of January 1, 1982, forty-seven states were parties to the London Convention. This list included only a handful of Pacific island states—Japan, New Zealand, Papua New Guinea, and the Phillipines. New Zealand's acceptance of the Convention did not extend to such affiliated islands as the Cook Islands, Niue, and Tokelau.

J. Paul Lomio, a Washington attorney, saw many weaknesses in the London Convention. It allows dumping of high-level wastes in exigent circumstances. While contracting parties are required to prevent and punish violations, exceptions are made for violators entitled to sovereign immunity under international law. Lomio also foresaw the creation of "pollution havens" which would issue permits with all the care currently shown in the licensing procedures of flag of convenience states.²⁰⁰

Gunther Handl, Alexander V. Humboldt Fellow at the Max Plank Institute, felt that the London Convention was strengthened by the Organization for Economic Co-Operation and Development Council decision establishing a multilateral consultation and surveyance mechanism for sea dumping of radioactive wastes.²⁰¹ Daniel P. Finn, Research Fellow at the Woods Hole Oceanographic Institution, noted that the London Convention was tightened up by International Atomic Energy Agency recommendations.²⁰² Both of these actions narrowed loopholes in the Convention by providing for more specific standards and greater international supervision.

Some issues remained unsolved by the London Convention. While it prohibited dumping high-level wastes "at sea," it is unclear whether or

198. See *supra* note 139 and accompanying text.

199. Summary adapted from Handl, *supra* note 197, at 306. Although the particular dispute to be discussed here involved low-level wastes, those portions of the Convention dealing with high-level wastes will also be discussed. It can be assumed that Pacific islanders who opposed ocean dumping of low-level wastes would similarly oppose ocean dumping of high-level wastes.

200. Lomio, *supra* note 192, at 271.

201. Handl, *supra* note 197, at 308 (discussing OECD Doc C(77)-115 (Final), reported in 17 *INT'L L. & MAR'L* 445 (1978)).

202. Finn, *Ocean Disposal of Radioactive Waste: The Obligation of Cooperation to Protect the Marine Environment*, 21 *VA. J. INT'L L.* 621, 651 (1981).

not the disposal of high-level wastes in the sub-seabed or emplacement in deep geological formations constitute disposal "at sea." These appear to be among the safest alternatives for high-level wastes. However, as Elisabeth Mann Borgese, a Senior Fellow at the Center for the Study of Democratic Institutions, commented, "[I]t may well be the safest place on earth . . . Surely something will go wrong sometime, somewhere—while the radioactive waste is shipborne, or during its burial—and the consequences will be apocalyptic."²⁰³ If something did go wrong, retrieval of wastes from these sites could be prohibitively difficult and expensive.

The recent Convention on the Law of the Sea²⁰⁴ will probably have a minimal effect in this area, and therefore will neither provide much support to the Pacific Islanders' position regarding nuclear dumping, nor serve as an adequate framework within which to address this issue. The treaty contains no specific references to the handling or disposal of radioactive wastes. George D. Haimbaugh, Jr., Professor of Law at the University of South Carolina, said that delegates to the Conference explained to him that this was because the subject was already covered by the London Convention.²⁰⁵ However, he believed that many existing treaties would be inferentially reinforced by several Law of the Sea treaty provisions. Those provisions include article 194, obligating states to take measures to prevent, reduce, and control marine pollution; article 210, requiring that states regulate dumping and calling for global and regional standards; article 216, prescribing responsibility for the enforcement of dumping regulations; and article 237, regarding existing conventions.²⁰⁶ In addition to reinforcing other treaties, the Law of the Sea Convention may attract signatories which have not yet signed, or observed, these other treaties. Haimbaugh also noted that the Law of the Sea Convention is "suffused with additional suggestions" that states act singly or cooperatively for the "conservation of the living resources of the sea," "the protection and preservation of the marine environment," and "the prevention, reduction and control of pollution."²⁰⁷ However, the inferential limitations on ocean dumping in the Law of the Sea Convention may have little practical impact. At the time of this writing, some nuclear powers, including the United States, were not parties to the Convention.

203 E. BORGESE, *THE DRAMA OF THE OCEAN* 213 (1974), quoted in Lomio, *supra* note 192, at 285-86.

204 United Nations Convention on the Law of the Sea, Third United Nations Conference on the Law of the Sea, Dist. GENERAL, A/CONF. 62/122, 7 October 1982 [hereinafter cited as LOS].

205 Haimbaugh, *Protecting the Seas From Nuclear Pollution*, 33 S.C.L. REV. 197, 207 n.62 (1982).

206 *Id.* at 224-25.

207 *Id.* at 210.

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The most important provisions of this treaty in regard to nuclear pollution may be buried in those sections dealing with the International Sea-Bed Authority and its control over the seabed, ocean floor, and sub-soil beyond national jurisdiction.²⁰⁸ The extent to which these provisions give the Authority control over nuclear waste disposal on or beneath the seabed, and the extent to which this control will be meaningful without United States acquiescence to the Convention, cannot be determined at this time.

B. *The Dispute Over Japanese Dumping Plans*

The Japanese delegation set off, armed with the London Convention, to explain its nation's dumping plans. It was not always greeted with traditional Pacific island hospitality. When the delegation met with island officials at the Second Annual Conference of the Association of Pacific Island Chief Executives on Guam, a regional magazine described the event as "Japanese Road Show Panned in Guam."²⁰⁹ Governor Paul Calvo of Guam expressed concern over health and environmental hazards. Tosiwo Nakamura, Speaker of the Palau Legislature, brought up the legacy of Bikini and claimed that any dumping accidents would create both real and perceived risks to fishing and tourism in Palau.²¹⁰ Governor Carlos Comacho of the CNM stated that only three Pacific nations—New Zealand, Papua New Guinea, and the Philippines—were parties to the London Convention. Governor Erhart Aten of Truk asked for a show of hands as to who opposed the dumping; the hands of all those present except the Japanese went up. Eight of the ten island leaders present signed a resolution opposing nuclear waste dumping, and copies were sent to the United States President, the Japanese Prime Minister, and the United Nations Secretary-General.

The team's South Pacific tour did not get more idyllic when it left Guam. In Western Samoa, their breakfast was interrupted by women parading through the hotel dining room with signs ranging from "Join the Nuclear Family and Have Funny Children" to a simple "NO." Prime Minister Tupola Efi was "too busy" to meet the team.²¹¹ One week before the delegation reached Tuvalu, the parliament there

208 See, e.g., LOS, *supra* note 204, arts. 157, 209, 215.

209 Eichner, *Face-Off Over Nuclear Dumping in Pacific—Japanese Road Show Panned in Guam*, *N.W. PAC.*, Nov.-Dec. 1980, at 10.

210 Nakamura is probably correct in assuming that even "perceived risks" of a "safe" level of radioactivity will have a disastrous effect on fishing and tourism. After the Bravo test, American importers refused to buy fish from Japan even when those fish met official U.S. safety standards. R. LAPP, *supra* note 35, at 129.

211 Afamasaga, *Samuan Women Have No Yen For Japanese Nuclear Waste*, *N.W. PAC.*, Nov.-Dec. 1980, at 13.

passed a resolution giving "full support to efforts the Tuvalu government is exerting now and in the future to prevent anyone dumping nuclear wastes of any description anywhere in the Pacific Ocean."²¹²

Protests escalated. The legislatures of Palau, CNM, and Federated States of Micronesia (FSM) also passed resolutions opposing the dumping plans.²¹³ Island leaders discussed a possible boycott of Japanese goods.²¹⁴ The CNM considered excluding Japanese vessels from its fishing zone if the dumping went ahead.²¹⁵ The governments of American Samoa, Hawaii, New Zealand, and Papua-New Guinea joined the protests.²¹⁶

Japan had justified the plan on the grounds that the dumping site was closer to Bonin than to any foreign territory.²¹⁷ This rare Japanese acceptance of the equidistance principle in the law of the sea was somewhat deflated when people on Bonin added their voices to the protests.²¹⁸ In the spring of 1981, Japan postponed its dumping plans "due to lack of funds."²¹⁹ On October 22, 1981 the Japanese Energy Council announced that it would review the dumping plans and explore ways to dispose of low-level wastes on sites near the plant which produced them.²²⁰

The Japanese dumping dispute illustrates how Pacific islanders are gaining increasing influence over international law regarding nuclear pollution of the ocean. The complaints of the Marshallese had little effect on American testing, although the data gathered from them probably helped bring about the Test Ban Treaty. The adverse publicity the United States received from their plight, and the costs of compensation, medical care, and island decontamination efforts have hopefully led to greater caution in nuclear testing. Pacific protests together with the legal maneuvers of Australia and New Zealand were pivotal in forcing French tests to go underground. These actions also pushed the Test Ban Treaty a step closer to the status of customary international law. They may have established norms of international law against atmospheric or surface testing outside a nation's own territory, and against tests which cause a significant amount of harm outside a nation's own territory. Finally, in the Japanese dumping controversy, a coalition composed primarily of micro-states and non-independent territories

212 *Tuvalu Registers Nuclear Protest*, *NEW PAC*, Nov.-Dec. 1980, at 33.

213 Kent, *Defusing the Danger*, *Pacific Nuclear Free Zone*, *NEW PAC*, Nov.-Dec. 1980, at 32, 33.

214 Quimby, *Hopeful Signs in Nuclear Dumping Issues*, *GLIMPS*, Winter 1981, at 17, 18.

215 Finn, *supra* note 202, at 622 n 7.

216 *Id.* at 666 n 7.

217 Eichner, *supra* note 209, at 10.

218 See Quimby, *supra* note 214, at 17.

219 *Newsgram*, *NEW PAC*, March-April 1981, at 60.

220 Quimby, *supra* note 214, at 17-18.

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may have prevented larger powers from dictating norms of international law which would permit radioactive dumping through the London Convention.

The policy of developed nations, when faced with demands from the Third World which affect their economic and military interests, has been that for any principle or treaty provision to become customary international law, it must have widespread and representative acceptance without any significant protest from states affected by application of the principle.²²¹ As Governor Camacho implied, the nations and territories which would be most affected by nuclear pollution in the Pacific are now prepared to follow this policy,²²² and are insisting that those nations which profit from nuclear activity must themselves assume the risks associated with nuclear by-products.²²³

IV. POSSIBLE AREAS OF FUTURE DISPUTES

Anti-nuclear actions and demands in the Pacific have gone beyond those discussed above. These actions include constitutional provisions designed to control the testing, storage, use, and disposal of radioactive materials within the jurisdiction of Pacific states,²²⁴ a United Nations resolution endorsing the establishment of a nuclear weapon-free zone in the South Pacific,²²⁵ recent official statements of opposition to nuclear waste disposal in the oceans,²²⁶ and grass-roots Nuclear Free Pa-

221. Haimbaugh, *supra* note 205, at 222.

222. See Eichner, *supra* note 209, at 10.

223. Kent, *supra* note 213, at 33 (quoting Camacho speech to U.N. Trusteeship Council).

224. See F.S.M. CONST. art. XIII, § 2, reprinted in 2 T.T. CODE 317 (1980); REPUBLIC OF PALAU CONST. art. XII, § 6, reprinted in 2 T.T. CODE 437 (1980).

The F.S.M. provision provides, "Radioactive, toxic chemical, or other harmful substances may not be tested, stored, used, or disposed of within the jurisdiction of the Federated States of Micronesia without the express approval of the national government of the Federated States of Micronesia."

The Palau provision states, "Harmful substances such as nuclear, chemical, gas or biological weapons intended for use in warfare, nuclear power plants, and waste materials therefrom, shall not be used, tested, stored or disposed of within the territorial jurisdiction of Palau without the express approval of three-fourths of the votes cast in a referendum submitted on this specific question." In a recent referendum held pursuant to this constitutional requirement, Palauan voters rejected a proposal to allow United States nuclear-powered and nuclear-armed ships access to their territory by a margin of 50 1% against to 49 1% for *Vote Puts Status of Pacific Isles Relations With U.S. in Doubt*, N.Y. Times, Feb. 13, 1983, at 10, col. 1.

See also REPUBLIC OF PALAU CONST. art. II, § 3, reprinted in 2 T.T. CODE 426 (1980) (governmental powers including defense may be delegated by treaty or compact to another nation, if such treaty or compact authorizes use, testing, storage, or disposal of nuclear weapons it must be approved by three-fourths of votes cast in referendum).

225. See Kent, *supra* note 213, at 32. The resolution, No. 3477, was passed on Dec. 11, 1975 by a vote of 110-0. Twenty nations, including the U.S., U.S.S.R., U.K., and France, abstained.

226. Micronesian Washington Office of the Federated States of Micronesia, News Release (October 20, 1982) (quoting speech by FSM President Tosiwo Nakayama, reaffirming his government's opposition to the dumping of nuclear and other toxic wastes in the ocean, and its policy of precluding such dumping in the F-SM's 200-mile economic zone).

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cific Conferences.²²⁷ These activities may lead to further disputes between Pacific islanders and nuclear powers.

With the United States and USSR increasingly relying on nuclear-powered vessels in their navies, and the possibility of nuclear-powered merchant ships, legal norms relating to such vessels could become the focus of a future dispute. Shortly after the United States Navy began using such vessels, Naval legal commentators proclaimed their safety. Captain Leonard R. Hardy stated that nuclear ships can be designed, built, and operated in a manner which would pose no significant hazard to man or the environment. He stated that the nature of the fuel element in the reactor is such that it cannot become an atom bomb, and said that "except in a collision" the effects of a nuclear accident would be confined to the ship itself.²²⁸ LCDR James H. Doyle noted that data from nuclear ships in operation revealed that while such ships do have some radioactive discharge, the level of radioactivity is low and has practically no effect on the environment.²²⁹

The optimistic comments from the United States military regarding nuclear vessels have turned out to be far more accurate than similar comments about nuclear tests. However, some commentators point out potential problems. One noted that land-based nuclear reactors are not likely to be involved in a collision, run aground on a reef, or carry explosives.²³⁰ William H. Berman and Lee M. Hydeman, co-directors of the University of Michigan Law School Atomic Energy Research Project, claimed that if an accident did occur, release of fission materials from a ship's power plant could cause almost immediate widespread damage to shore areas within a radius of fifty miles, with contamination of sea resources extending over a greater area.²³¹

Two major treaties deal with nuclear vessels. The first is SOLAS,²³² which applies only to merchant vessels. Under SOLAS, a flag state must approve the design, construction, and inspection standards for reactors. It must develop operating manuals and conduct surveys of radiation safety to insure there are no unreasonable hazards to crew, passengers, the public, waterways, and marine resources. Flag states should make safety assessments available to potential port states, which

227 Kent, *supra* note 213, at 36. Conferences were held in Fiji in 1975, Ponape in 1978, and Honolulu in 1980.

228 Hardy, *The Atom at Sea: International Law and Nuclear Shipping*, JAG J., April 1959, at 9, 10.

229 Doyle, *supra* note 123, at 32. Accord Finn, *supra* note 202, at 671.

230 *Nuclear-Powered Merchant Ships*, 229 L. TIMES 249, 249 (1960).

231 Berman & Hydeman, *International Control of the Safety of Nuclear Powered Merchant Ships*, 59 MICH. L. REV. 233, 241 (1960).

232 International Convention for the Safety of Life at Sea, June 10, 1948, T.I.A.S. No. 2495, 164 U.N.T.S. 113, as amended by INTERNATIONAL CONFERENCE ON SAFETY OF LIFE AT SEA, IMCO Doc. No. IMCO/SAFCON/25/Rev. 1 (1960).

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have the right to refuse entry.²³³ The other major treaty is the Brussels Convention on the Liability of Operators of Nuclear Ships.²³⁴ The Brussels Convention covers all ships with nuclear power plants. It came about because of fears that the aggregate claims arising from a large scale nuclear incident could exceed the existing resources of the insurance industry.²³⁵ This Convention provides that the ship owner has absolute liability, with exceptions only for sabotage, war, and insurrection. A licensed owner's liability is limited to \$100 million for each vessel in a single incident. There is no limitation on the liability of an unlicensed owner. If a flag state does not take all measures necessary to compel an operator to become licensed, the flag state risks liability of up to \$100 million. A statute of limitations is set at ten years from the date of an incident. Jurisdiction rests in either the licensing state or the state where the damage occurs, except in the case of warships where jurisdiction lies only with the flag state.²³⁶

Nuclear vessels are also dealt with briefly in the Law of the Sea Convention. Articles 22 and 23 limit the right of innocent passage through territorial seas by nuclear-powered ships and ships carrying nuclear materials. Coastal states may confine their passage to designated sea lanes. These vessels must carry documents and observe special precautionary measures established by international agreements.

There are many reasons why these treaties might not provide adequate reassurance to Pacific islanders. Berman and Hydeman felt that SOLAS leaves much to be desired. They noted that many port states would be unable to assess the required technical reports,²³⁷ certainly a likely problem for Pacific microstates. They further commented that port states have to rely on a flag state's good faith, a problem with flag of convenience states which are probably not equipped to evaluate reactor safety.²³⁸ They also noted that a port state's right to exclude unsafe nuclear vessels offers little protection given the possible range of a

233 Summary of SOLAS adapted from Berman & Hydeman, *supra* note 231, at 239-40.

234 Brussels Convention on the Liability of Operators of Nuclear Ships of 25 May 1962. For text, see the following: International Conventions of Civil Liability for Nuclear Damage, IAEA Legal Series No. 4, at 36-46 (Vienna, 1966); 4 PROGRESS IN NUCLEAR ENERGY, Series X app. I (1966).

235 Note, *The 1962 Brussels Convention on the Liability of Operators of Nuclear Ships*, 57 AM J INT'L L. 100, 101 (1963) [hereinafter cited as Note, *Brussels Convention*].

236 Summary of treaty provisions adapted from Hardy, *The Liability of Operators of Nuclear Ships*, 12 INT'L & COMP. L.Q. 778 (1963); Szasz, *The Convention on the Liability of Operators of Nuclear Ships*, 2 J. MAR. L. & COM. 541 (1971).

237 Berman & Hydeman, *supra* note 231, at 242-43. *Contra* Hardy, *supra* note 228, at 11 Hardy claimed that with the technical data being published, physicists, engineers, and ship designers in all port states will be able to evaluate this type of data. He did not say where all the microstates in the Pacific, many of which admittedly did not exist when he made his comments, would acquire physicists, engineers, and ship designers.

238 Berman & Hydeman, *supra* note 231, at 242-43.

nuclear accident.²³⁹

Berman and Hydeman suggest that coastal states be given the right to inspect reactors on nuclear vessels.²⁴⁰ However, as LCDR William R. St. George notes, this will never come about for military vessels. For reasons of military secrecy, they "cannot be laid bare to public or foreign government scrutiny as is suggested . . . for merchant ships. They must be accepted, if they are to be accepted at all, solely on the basis of their reputation as safe ships and on confidence in the Navy which built and operates them."²⁴¹ This creates a dilemma for Pacific islanders, who must weigh the safety record of American nuclear vessels and the strong residual good will the United States Navy earned by liberating their islands from the Japanese against the record of United States nuclear operations in the Pacific when considered as a whole.

There are also problems with the Brussels Convention. The \$100 million limitation could be insufficient to cover actual damages. Recovery could be further limited in a flag state court if there were a residual notion that "life is cheap" in non-Western areas. In many flag states, recovery for the wrongful death of a Marshallese who provided for all of his extended family's needs through subsistence fishing and agriculture would be much less than recovery for the wrongful death of a local wage-earner whose salary could not provide for his nuclear family. As the Marshallese example showed, the ten-year statute of limitations is inadequate to cover many effects of radiation exposure. The Marshallese experience also indicates, without attributing these motives to the United States, that a nation powerful enough to cause a nuclear mishap may have the power to isolate potential plaintiffs in locations so remote that they would have no access to courts, or mislead them with optimistic medical reports, for more than ten years. Furthermore, it could be difficult for a claimant to establish causation.²⁴² For example, given that the miscarriage rate of exposed Rongelapese women doubled, any individual claimant could only prove that there was a fifty-fifty chance that her miscarriage was caused by nuclear radiation.

The most significant shortcoming of the Brussels Convention is that it was not ratified by either the United States or the USSR. The reasons given by each illustrate how the Soviets score propaganda victories on nuclear issues even when their actual behavior is identical to that of the United States. The United States claimed that responsibility

239. *Id.* at 242-43.

240. *Id.* at 253.

241. St. George, *International Operational Regulations and the Nuclear-Powered Ships*, JAG J., April 1959, at 20, 24.

242. *Cf. Siasz, supra* note 236, at 560 (discussing proof of causation problems relating to harmful effects of radiation that do not become known within 10 years).

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for damages caused by warships was not a matter for civil law, but rather for public international law. The Russians claimed that by limiting state responsibility in accidents caused by warships, the Convention legalized the use of nuclear energy for purposes of war.²⁴³

Most Pacific island nations have accepted the Law of the Sea Convention, although it does not solve all of the problems attributed to SOLAS by Hydeman and Berman. This acceptance may reflect a trade-off, as Pacific states will benefit from other provisions of this treaty, such as those creating a 200-mile exclusive economic zone.²⁴⁴ However, this treaty shares one shortcoming with the Brussels Convention. A major nuclear power, the United States, is not a party. In short, existing international law regarding nuclear vessels contains many loopholes which could cause Pacific islanders to believe that their interests are not adequately protected.

Floating nuclear power plants are another possible source of future conflict, though none have yet been constructed. Marlow J. Blake, President of the Environmental Law Society at the University of Miami, noted that existing plans would place them within territorial seas.²⁴⁵ Admiral Max K. Morris, Professor of International Business at the University of North Florida at Jacksonville, and John W. Kindt, Associate Professor of Graduate Business Law at the University of Illinois, claimed that no norm of international law flatly prohibits, or permits, construction of such plants in a contiguous zone, economic zone, or on the high seas.²⁴⁶ Blake stated that with adequate retrieval plans and on-shore disposal of wastes, it might be possible to design and locate a plant so that it would have almost no perceptible effects beyond national jurisdiction—barring a disaster such as a collision, design defect, war, or act of God.²⁴⁷ Morris and Kindt noted that plants have potential problems with thermal discharge and perimeter contamination, while a small irradiation accident could cause *Trail Smelter* type injuries to another country's fish supply leading to enormous recoverable damages.²⁴⁸ Borgese stated that if a floating plant had an accident, it could release enough strontium-90, a leukemia-causing agent, to contaminate thousands of cubic miles of water. She also observed that the thousands of cubic miles of contaminated water might fail to

243. Note, *Brussels Convention*, *supra* note 235, at 109.

244. See generally LOS, *supra* note 204, arts. 55-75.

245. Blake, *Floating Nuclear Power Plants—A "Reasonable" Use of the High Seas*, 8 CAL. W. INT'L L.J. 191, 192 (1978).

246. Morris & Kindt, *The Law of the Sea: Domestic and International Considerations Arising from the Classification of Floating Nuclear Power Plants and Their Breakwaters as Artificial Islands*, 19 VA. J. INT'L L. 299, 310-13 (1979).

247. Blake, *supra* note 245, at 194.

248. Morris & Kindt, *supra* note 245, at 308-09.

respect the boundaries of territorial seas.²⁴⁹ While existing plans call for floating plants capable of withstanding the greatest wind and waves experienced in the past century, Borgese asks, "What if the wind and waves are greater this century than last?"²⁵⁰

Given the possible effects on their migratory tuna supplies, Pacific islanders are likely to oppose floating nuclear power plants. However, Blake suggested that states might try to justify plant construction under a McDougal-Schlei balancing test on the theory that dependence on foreign energy sources jeopardizes national security.²⁵¹

There are other possible sources of future conflict. Borgese noted that no existing law or norm would prohibit undersea military stations powered by nuclear reactors.²⁵² Dr. John Craven, Dean of Marine Studies at the University of Hawaii and a designer of the United States Navy's Poseidon system, stated the following:

[T]he concept of sea-based strategic deterrence which appears to have been adopted in whole or in part by the governments of France, Britain, the U.S.S.R., and the U.S., is not compatible with the notion of a denuclearized ocean. It is thus now generally recognized that the Treaty to Prohibit Emplacement of Weapons of Mass Destruction on the Seabed and Ocean Floor is more symbolic than substantive. This is particularly true since it is as easy, or easier, to design systems that float about the ocean floor as it is to design systems fixed to the ocean floor.²⁵³

This need for a sea-based deterrent is already leading to conflict. Vanuatu and Fiji have closed their ports to United States Navy warships because, pursuant to Pentagon policies, the United States will not give assurances that the ships do not carry nuclear weapons.²⁵⁴

There are two major barriers to islanders' anti-nuclear efforts. The first is economic. Many Pacific states and territories are economically dependent on their former or current administrators. It is possible that anti-nuclear demands will yield to either offers of aid or threats to reduce aid. It had been claimed that United States policy in Micronesia was intentionally designed to replace a self-sufficient subsistence econ-

249 E. BORGESI, *THE DRAMA OF THE OCEANS* 212 (1975).

250 *Id.* at 212. Writing three years later, Blake was more optimistic. He claims the plant will have the capacity to withstand sustained winds of 300 miles per hour, a collision with any supravessel afloat, and the greatest wave estimated to occur within the next ten thousand years. Blake, *supra* note 245, at 192 (citing U.S. DEPT. OF COMMERCE (NOAA), *REPORT TO THE CONGRESS ON OCEAN POLLUTION, OVER-FISHING AND OFFSHORE DEVELOPMENT*, JULY 1973-JUNE 1974, at 60 (1975)).

251 Blake, *supra* note 245, at 204, 207.

252 E. BORGESI, *supra* note 249, at 188.

253 Craven, *A Legal Regime for Arms Control and Pollution Control in the Oceans*, in *TITLE TIDES OF CHANGE* 100, 103 (E. Borgese & D. Krieger ed. 1975).

254 Trumbull, *Pacific Atolls Show Feisty Independence*, *N.Y. Times*, Oct. 24, 1982, § 4 (Week in Review), at 2E, col. 3.

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omy with a welfare state dependent on United States aid to insure Micronesian compliance with United States security demands.²⁵⁵ However, islanders cannot always be bought off. The Fullard-Leo family purchased Palmyra Atoll in Hawaii for \$15,000 in 1922.²⁵⁶ They refused a recent United States government offer of \$18 million for the atoll because of government plans to use it as a nuclear waste dump. Dudley Fullard-Leo noted that the atoll's corrosive climate made it difficult to store anything there, while its waters feed three equatorial currents rich in tuna and other edible fish.²⁵⁷

The second barrier that Pacific islanders face is the theory that international law can be ignored (or, as the Brezhnev doctrine illustrates, rewritten) when "supreme interests" are jeopardized.²⁵⁸ The standards for determining what constitutes a supreme interest vary, and perversions of this theory and McDougal and Schlei's theories could encompass almost any nuclear activity. If superpowers reduce international law to a "pure power"²⁵⁹ theory test of strength, most Pacific micro-states lack the power to protect their own supreme interests against actual or threatened gunboat diplomacy.

There are good reasons for the United States and its allies to avoid this heavy-handed alternative. As a result of having experienced occupation by a totalitarian power, and having been liberated by the United States, most Pacific states tilt strongly towards the United States and away from the U.S.S.R. in their foreign (or in the case of United States territories, quasi-foreign) policies. They generally support the United States in the United Nations, refuse Soviet economic aid, and reject Soviet requests for resident diplomatic representation.²⁶⁰ However, as Dwight Heine, a Marshallese who has been a Trust Territory official and *Pauling* plaintiff, noted, United States nuclear activities in the Marshalls caused many Marshallese to forget initial United States accomplishments in health and education as "the residual image of 'Liberator' faded away and the facsimile of 'oppressors' zoomed into prominence."²⁶¹ A successful effort at forcing one Pacific state to, for example, accept nuclear wastes may open up a port for Russian war-

255 Tiffin, *supra* note 38. *Contra* D. NEVIN, *THE AMERICAN TOUCH IN MICRONESIA* 30 (1977) (condition of Micronesian economy is result of U.S. incompetence, not conspiracy).

256 Thomas, *supra* note 94, at 30.

257. *Refusal on Palmyra*, PAC. ISLANDS MONTHLY, Oct. 1979, at 23, 23.

258 See generally J. SWEENEY, C. OLIVER & N. LEECH, *supra* note 157, at 83-84 (quoting B. TUCHMAN, *THE GUNS OF AUGUST* 127 (1962)).

259. See generally J. SWEENEY, C. OLIVER & N. LEECH, *supra* note 157, at 1222 (quoting McDougal, *International Law: Power and Policy: A Contemporary Conception*, 1 *Academie de Droit International*, *Recueil des Cours* 137 (1953)).

260 Trumbull, *supra* note 254, at E2, col. 3.

261 D. Heine, *supra* note 82, at 29.

ships elsewhere.²⁶²

The days when continent-based nuclear powers could dictate norms of international law regarding nuclear pollution to Pacific islanders are waning, if not over. In the future it will be necessary to include Pacific nations and territories in the law-making processes to avoid the type of reaction which sank Japanese dumping plans and undermined the London Convention.

Pacific Islanders will bring a deep mistrust of anything nuclear to the bargaining table. Almira Matayoshi, a Rongelapese woman who was eighteen years old when caught in the Bravo snow storm, has lost four children at birth. In a 1980 interview she claimed, "The people who are testing don't care about people on Rongelap and did not care then. I will not forget what happened to the people of Rongelap."²⁶³ As Pearl Buck stated in discussing the Japanese reaction to the fate of the Japanese fishermen caught in Bravo's fallout, "Time and effort . . . have not erased memories. These are permanent. And permanent memories have a way of erupting . . ."²⁶⁴ While the Western powers cannot erase these memories, they can take certain actions which could convince Pacific islanders of their current good faith. These include the following: allowing independent scientific and medical investigations of places and persons exposed to fallout;²⁶⁵ settling radiation-related claims through an impartial claims commission after receiving the reports of these independent investigations, rather than through haphazard legislation or negotiations between parties of grossly unequal bargaining power; and establishment of a fund to compensate future victims of lingering radiation, genetic defects, and homelessness. Nations under the umbrella of United States nuclear protection which did not share the radioactive costs of nuclear testing could contribute to the compensation. The same could be done by nations under the umbrella of France's nuclear protection, if there are any. Given general attitudes in the Pacific about the United States and Russia, proof that Western powers will make good faith efforts to avoid any further nuclear mishaps and to atone for any which do occur is likely to result in good

262 Recently Vanuatu said it would permit Soviet warships to use its ports, while Fiji said it was reviewing a ban it imposed on all Soviet ships after the invasion of Afghanistan. Trumbull, *supra* note 254, at E2, col. 5. These actions appear to be a result of disagreement with the Western bloc on a variety of issues, including nuclear issues. Perhaps Vanuatu feels that by relying solely on one side in superpower conflict, it leaves itself unable to resist any of that side's policies and demands. While this is clearly a minority view in the Pacific, if Western demands for nuclear uses of the ocean are viewed as excessive, other Pacific states might try to protect their interests by playing off the two superpowers against each other.

263 H. WASSERMAN & N. SOLOMON, *supra* note 44, at 86-87.

264 Buck, *Foreword* to R. LAPP, *supra* note 35, at xi-xii.

265 Although this creates the possibility that some of the information discovered could be leaked, leaks at this late date will probably not be of great help to the Soviets. By now they have had the opportunity to gather similar data from their test sites in their own country.

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faith efforts by islanders to accommodate truly legitimate Western security needs.

V. CONCLUSION

In 1947 Albert Einstein compared the discovery of nuclear fission to the discovery of fire. Reporters Harvey Wasserman and Norman Solomon commented that Einstein failed to note how long it took primitive human society to control that fire.²⁶⁶ Wasserman and Solomon failed to note that even now there are still accidental fires and arson. Pacific islanders have been convinced that not only has modern human society not yet learned to control the nuclear fire, but that certain segments of this society are not concerned about controlling nuclear fires so long as they are ignited thousands of miles away.

Early norms of international law dealing with this fire were developed by a handful of powerful nations. These norms stressed "reasonableness" and "balancing of interests," but were used to justify activities that were definitely careless and probably neither reasonable nor balanced. As the victims of nuclear activities gained an increasing say about affairs in their ocean, they asserted themselves in an effort to revise the norms which had jeopardized their health and their homelands. In some cases they sought new norms which would preserve their own legitimate interests, many of which would benefit all mankind. However, if there are nuclear uses of the ocean which would be reasonable under the normal definition of the word, rather than just under a McDougal-Schlei balancing test, nuclear powers will have to shoulder a heavy burden of proof to gain Pacific acceptance of these uses.

One Pacific writer has summarized the situation as follows:

The prevailing view appears to be that if one can find something in international law that does not flatly prohibit an action, then that action is not only legal, it is right.²⁶⁷ However, . . . it is plain that there are a great many declarations, resolutions, and official and unofficial statements which show very clearly the depth and breadth of opposition to the nuclearization of the Pacific. These, too, are sources of international law.

Nuclear activities raise profound issues of justice—and of survival. Present formal international law remains a weak and incomplete basis

266. H. WASSERMAN & N. SOLOMON, *supra* note 44, at 269.

267. See generally M. McDUGAL & W. BURKE, *supra* note 124, at 791 ("We have already reviewed the tentative organized [international] community response to this claim . . . [of access to the ocean for nuclear testing] . . . and noted the failure to agree on prescriptions absolutely forbidding this new use."); *Judicial Silence*, *supra* note 152, at 631 ("[T]he French government insisted that the dispute was purely political because there is no rule of international law which prohibits atmospheric testing as the only existing norm . . .") [footnote added].

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of doctrine, one far too narrow to use as a basis for deciding such fundamental questions. If international law is to be used, it should be evident, given the enormous diversity of views, that what is needed is the creation of new law, law based on sustained dialogue among all those concerned.²⁶⁸

SETH FORMAN*

268 Kent, *supra* note 213, at 36

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