

**“All Bets Were Off”: Changes in
Scientific Causation and Tort Law
through the Lens of Agent Orange
from 1984 to 2005**

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Introduction:

Agent Orange, an herbicide used during the Vietnam War, occupies a unique place in the American psyche. On the one hand, the use of it and other similar herbicides and defoliants may have saved countless lives during the war, helping to protect American troops. On the other, Agent Orange contained highly toxic dioxin, a chemical that has been blamed for numerous medical problems among veterans, Vietnamese, and their families. The legal cases that have developed regarding Agent Orange balance a number of contentious issues, from the rights of former servicemen to sue the government to what kind of evidence is necessary to show that dioxin caused a disease.

In a lawsuit filed in 1979, *In re 'Agent Orange' Product liability Litigation* (MDL No, 381), a group of lawyers came together to sue the chemical companies that produced these herbicides on behalf of all veterans of Vietnam service, alleging that Agent Orange had caused cancers, birth defects, and other harms. Many of the plaintiffs and their lawyers saw this not as just a lawsuit, but as a sacred quest to receive justice in the form of acknowledgment of and compensation for the harms suffered as a result of service. However, the lawsuit was larger than either of the initial players. It was not the first class action toxic tort suit, but it became the most complicated one. The entrance of Judge Jack Weinstein, a mercurial judicial activist, and his efforts to force the parties to settle, made it almost inevitable that the lawsuit would make history. By its end, it was the single largest lawsuit settlement in history, totally \$180 million 1984 dollars plus interest, or over 1/3 of a billion dollars today. This was despite quite limited evidence that dioxin was even responsible for the illnesses claimed by the veterans.

In 2004, Agent Orange returned to the forefront of the national stage. This time, in *VAVAO vs. Dow Chemical, Monsanto et al.*, a group of Vietnamese citizens had brought suit, again against the same chemical companies, on behalf of the entire population of Vietnam injured by dioxin. By 2004, dioxin had been heavily studied, and epidemiological work that had just been beginning at the time of the first lawsuit could provide more definitive answers. Yet, the Agent Orange plaintiffs, seeking redress for grievances that went beyond anything the court could provide, had their case dismissed.

These two cases provide unique snapshots of the legal system's handling of the same sets of questions in two very different years. Handled by the same judge, about the same substance, and containing many of the same tort issues, they provide a valuable opportunity to view the legal system's changes. Certainly, not all aspects of the cases were constant. Different populations were involved, different lawyers pursued each case, and different outcomes occurred. From 1984 to 2005, tort law and scientific causation in the courtroom went through significant shifts, from differences in the evidence for causation to the rise of the mass toxic tort; the contrast between *In re 'Agent Orange' Product liability Litigation* and *VAVAO vs. Dow Chemical, Monsanto et al.*, illustrates the difference that such shifts made in outcomes for plaintiffs and defendants.

Part I: Background on Agent Orange and Causation

Agent Orange and Dioxin:

Herbicide Use in Vietnam:

The herbicide program in Vietnam began as a method of destroying ground cover and crops to deter enemy combatants who relied on jungle and local supplies to attack US troops. At the beginning of the program, a number of different substances were used, each with its own unique purpose. The first defoliant used was Agent Purple, which was effective against broadleaf plants and jungle cover. The second was Agent Blue, which was an arsenic compound for the destruction of rice crops and rapid defoliation. 1.9 million liters of Agent Purple were sprayed over a relatively small area before 1965, which could lead to extremely high levels of TCDD (dioxin) within the spray zone.¹ Agent Orange was used much more widely, rather than in such a concentrated zone, and as a result medical concerns persist about its effects.

Agents Green and Pink, more generic broad leaf plant defoliants, were used in smaller quantities (latest estimates indicate that 464,164 liters of Green and 31,026 were procured).² Agent Orange and Agent White were added to the arsenal later. Agent White was a desiccant that persisted in soil, which was ideal for long-term forest control.³

Agent Orange was, by 1965, the most widely used herbicide in Vietnam, accounting for 60% of all chemicals sprayed.⁴ Agent Orange was found to be the most

¹ Stellman, JM, Stellman, SD, Christian RC, Weber, TW and Tomasallo, C. The extent and patterns of usage of Agent Orange and other herbicides in Vietnam. *Nature*, 422, 681-687, 2003 (cover article). Pg. 682,4.

² Ibid. 682.

³ IOM (Institute of Medicine.) 2008. *Veterans and Agent Orange: Update 2008*. Washington, DC: The National Academics Press.47.

⁴ Gough, Micheal. *Dioxin, Agent Orange: The Facts*. New York, NY: Plenum Press, 1986. 52.

effective agent for defoliation and crop destruction, with “leaf fall in three weeks and control persisting for seven to twelve months.” However, unlike the other herbicides used in Vietnam, Agent Orange was not marketed to consumers in the United States, and was only designated for industrial and military use. Agents Blue, Pink, and White were all commercially available in the United States during the Vietnam era. Most Agent Orange was sprayed in Operation Ranch Hand, a series of air-based defoliation missions, but some was also used around campsites, and some was used for crop destruction.⁵ In 1966, Agent Orange became difficult to obtain, due to rising costs for chemicals, and Agent White was substituted.⁶

Usage of Agent Orange in Vietnam:

Operation Ranch Hand was the largest single defoliation effort in Vietnam, and it remains the only military deforestation mission the United States Army has undertaken. It began in January 1962, and used two types of aircraft: C-123 fixed wing planes and helicopters. Originally, the intention had been to use only the aircraft, but the high demand for defoliation in specific areas caused a partial shift to helicopters.⁷

By 1965, Agent Orange had become the primary herbicide and Ranch Hand had significantly increased in size. Permanent crews were assigned, and the total number of sorties increased. Ranch Hand missions were especially vulnerable to attack from small arms on the ground, given the low altitude and flight speed. Many “Ranch Handers,” as they were called, received Purple Hearts.

⁵ Gough, Micheal. *Dioxin, Agent Orange: The Facts*. New York, NY: Plenum Press, 1986. 49.

⁶ Stellman, JM, Stellman, SD, Christian RC, Weber, TW and Tomasallo, C. The extent and patterns of usage of Agent Orange and other herbicides in Vietnam. *Nature*, 422, 681-687, 2003 (cover article). Pg. 682.

⁷ IOM (Institute of Medicine.) 1991. *Veterans and Agent Orange: Health Effects of Herbicides Used in Vietnam*. Washington, DC: The National Academics Press. 86.

Information about Operation Ranch Hand has become easier to interpret over time. Data containing the location, distance, and defoliant spread of flights had been collected in the MACV (Military Assistance Command, Vietnam) logbooks and was transferred to the HERBS tapes during the 1970s. Although these logs contain formidable records of C-123 fixed wing flights, they do not account for perimeter base spraying or helicopter defoliant distribution.⁸ Similarly, logbook data can only recreate some of conditions of the spraying, as particulars of distance and density depended on the weather conditions, terrain, and turbulence. Given that those were not recorded, it was difficult to reconstruct exactly what was sprayed where.⁹

The same studies that attempted to pinpoint herbicide distribution also attempted to determine total amount of herbicide used and the pattern of spray. A 1974 National Academy of Science (NAS) study constructed a model of spray distribution based on the HERBS tapes and aerial photography and estimated the total percentages of each herbicide sprayed for deforestation, crop destruction, etc.¹⁰ A follow-up study, “The Extent and Patterns of Usage of Agent Orange and other Herbicides in Vietnam,” was published in 2003, and was more successful in reconstructing spray patterns; it revised

⁸ Committee on the Effects of Herbicides in Vietnam, National Research Council. *The Effects of Herbicides in South Vietnam: Part A- Summary and Conclusions*. Washington DC. National Academy of Sciences. 1974. S-5.

⁹ IOM (Institute of Medicine.) 1991. *Veterans and Agent Orange: Health Effects of Herbicides Used in Vietnam*. Washington, DC: The National Academics Press. 87.

¹⁰ Committee on the Effects of Herbicides in Vietnam, National Research Council. *The Effects of Herbicides in South Vietnam: Part A- Summary and Conclusions*. Washington DC. National Academy of Sciences. 1974. S-6.

previous estimates upward by about 7 million litres, specifically with regards to Agents Pink, Purple and Orange.¹¹

Ground Troops and Spraying:

The Army had a stated policy not to move troops into an herbicide-sprayed area until six weeks after the spraying. Some veterans remember being in areas that were actively sprayed 72 hours earlier, or even being in the bush as the spraying was occurring, including one quoted in Fred Wilcox's book *Waiting for an Army to Die*:

“In October of 1968,” one former combat infantryman testified, “we saw helicopters spraying intermittently in the valley in front of us. There were hills among us. Three days later we assaulted the hill...and that night we slept on the ground, ponchos just covering us. At the time we saw the spraying, we thought it was nerve gas. We had no idea it was Agent Orange.”¹²

Similarly, other veterans told stories of eating herbicide-covered food or sleeping amongst herbicide-contaminated plants. In bases that stored Agent Orange, the situation was even worse. Veteran Joe Naples recalls, “guys pile[d] empty barrels of Agent Orange] around their bunkers, and if the bunker took a hit, they would get sprayed with whatever was left of the stuff inside those barrels.”¹³ Despite continued attempts to clarify emissions, there is not enough data to combine them with troop movements to gain an accurate picture of how much ground troops were exposed to dioxin, or to corroborate these anecdotes.

¹¹ Stellman, JM, Stellman, SD, Christian RC, Weber, TW and Tomasallo, C. The extent and patterns of usage of Agent Orange and other herbicides in Vietnam. *Nature*, 422, 681-687, 2003 (cover article). Pg. 681.

¹² Wilcox, Fred A. *Waiting for an Army to Die*. New York: Random House. 1983. Pg. 89.

¹³ *Ibid.* 38.

In addition to aerial spraying, a limited amount of Agent Orange was used to clear the foliage around permanent bases. This spraying was usually done with backpack sprayers or “buffalo turbines” mounted on trucks. The Navy also sprayed the edges of rivers. Ground troops who performed these duties were not trained to handle chemicals like the Ranch Hands.

Agent Orange’s Chemical Composition and TCDD Effects:

Agent Orange was a 50:50 mix of two chemical compounds 2,4-D and 2,4,5-T. The 2,4,5-T contained 2,3,7,8-tetrachlorodibenzo-*p*-dioxin (2,3,7,8 TCDD) or dioxin, a contaminant, as it was made from trichlorophenol, the first substance to be recognized as being contaminated by dioxin at a chemical plant in Germany in 1957.¹⁴ Dioxin can also be introduced into the atmosphere by combustion.

A common misconception is that dioxin was a deliberately added ingredient to the Agent Orange herbicide mixture. In fact, dioxin is almost always a contaminant to otherwise useful chemical substances, “an unavoidable byproduct.”¹⁵ High TCDD levels were a byproduct of the increased heat used to speed up chemical reactions.¹⁶ Chemical companies like Dow, Monsanto, and Diamond had little incentive to produce a less contaminated product, because there was no attempt to measure dioxin content.

Because TCDD was an unwanted reaction contaminant, individual TCDD levels for Agent Orange shipments were not recorded, and barrels contained mixtures of products produced at different temperatures. Thus, dioxin levels in Agent Orange

¹⁴ Gough, Micheal. *Dioxin, Agent Orange: The Facts*. New York, NY: Plenum Press, 1986. 34.

¹⁵ *Ibid.* 28.

¹⁶ Young AL, Thalken CE, Arnold EL, Cupello JM, Cockerham LG. 1976. *Fate of 2,3,7,8 tetrachloro-dibenzo-p-dioxin (TCDD) in the Environment: Summary and Decontamination Recommendations*. Colorado Springs: US Air Force Academy. USAFA TR 76 18.

depended on both the manufacturers who produced the specific barrels and the heat at which the herbicide was produced. Dioxin levels varied from barrel to barrel and from shipment to shipment, and the only way to recover information about actual contamination is by sampling.

Two studies attempted to determine the dioxin content of the herbicides sprayed—the 1974 NAS study and the 2003 Stellman study. The 1974 NAS analysis calculated a mean TCDD level of 1.91 ppm (+/- 20%) for Agent Orange, but the study authors later determined that this included “low dioxin” production runs that were not representative. The 2003 estimates revised this number up to 13 ppm TCD for Agent Orange, 32.8 ppm for Agent Purple and 65.5 ppm for Agent Pink.¹⁷ In the historical literature, Agent Orange is often used to refer to the collective herbicides that contained TCDD.

TCDD at low and moderate doses has a half-life of approximately 8 years in the human body. The most common reaction to TCDD poisoning is chloracne, a severe form of acne that can lead to permanent scarring and disfigurement. Chloracne is a definitive sign of TCDD poisoning, but the converse is not true. Some people with high dioxin levels do not develop chloracne, for reasons that remain unknown.

TCDD is stored in the fatty tissue of the body, and is currently classified as a Group 1, the highest risk level, carcinogen for humans by the International Agency for Research on Cancer. The most recent Veterans and Agent Orange Update from the Institute of Medicine (2008) found five diseases that were positively associated (but not necessarily mechanistically linked) with herbicide use in Vietnam, including soft-tissue

¹⁷ Stellman, JM, Stellman, SD, Christian RC, Weber, TW and Tomasallo, C. The extent and patterns of usage of Agent Orange and other herbicides in Vietnam. *Nature*, 422, 681-687, 2003 (cover article). Pg. 684.

sarcoma, non-Hodgkin's lymphoma, chronic lymphocytic leukemia (CLL), Hodgkin's disease and the aforementioned chloracne.¹⁸

Veterans and the Post War Environment:

The post Vietnam experience was not a positive one for many veterans. Veteran Ray Clark recalls, "The movies, books, radio, newspapers had [veterans] typed as baby killers, psychos, drug addicts... ." Many returned to find communities that were not supportive, and their experience contrasted strongly with that of veterans of previous wars, creating conflicts amongst Vietnam veterans who tried to join organizations like the American Legion.¹⁹

Vietnam Veterans began to organize around their status, some to oppose the war and some to protest their treatment when they returned from it. Many found themselves with severe trauma and health problems. More and more veterans reported to the VA that they had developed unusual cancers or fathered children with birth defects.²⁰ Anti-Agent Orange activism became, to a certain extent, a way to advocate for the rights of veterans in a country deeply divided about the Vietnam war and its meaning. Veteran Jerry Straight, whose daughter was born with severe developmental disabilities, described the situation: "When I went to Vietnam, I took my chances... There was always the possibility that I would be killed or wounded, but I didn't think my children would ever be a casualty of the war."²¹

¹⁸ IOM (Institute of Medicine.) 2008. *Veterans and Agent Orange: Update 2008*. Washington, DC: The National Academics Press.7.

¹⁹ Wilcox, Fred A. *Waiting for an Army to Die*. New York: Random House. 1983. Pg. 6.

²⁰ IOM (Institute of Medicine.) *Veterans and Agent Orange: Health Effects of Herbicides Used in Vietnam*. Washington, DC: The National Academics Press. 1991.

²¹ Wilcox, Fred A. *Waiting for an Army to Die*. New York: Random House. 1983. Pg. 57.

Many veterans felt that the VA was unresponsive, stonewalling them and requiring them to make the case that they had been exposed to Agent Orange and that it had caused what ailed them. Increasingly, by the late 1970s, they turned to outside sources, like fringe doctors and other veterans, for treatment and support.²² It was in this difficult environment that the first major Agent Orange lawsuit was filed.

Causation:

Toxic Tort Case Causation:

Toxic tort cases involve claims that harm was caused by an avoidable exposure to a toxic substance like asbestos or dioxin. In toxic tort cases, one must prove that the defendant neglected a duty to prevent people from being exposed to a harmful dose of a potentially toxic substance, and that exposure to this substance can generally cause harm, and that the specific harm(s) of the plaintiff(s) were caused by the exposure to the substance at issue. The standards for proving general causation are rigorous, usually involving scientific evidence from epidemiology, toxicology, biologists, and statisticians.

Two types of causation must be shown in order for a plaintiff to successfully receive damages- general and specific causation. General causation, which needs to be demonstrated first within the context of the modern tort system,²³ is evidence that Substance X can cause Harm Y of the type the victim suffered. In cases like car accidents or other non-toxic torts, general causation is not a fact in question- common knowledge illustrates that a couple of tons of metal can cause injury to a pedestrian. However, in toxic torts, whether the harms suffered by the plaintiffs can even be

²² Wilcox, Fred A. *Waiting for an Army to Die*. New York: Random House. 1983. Pg. 84.

²³ Cranor, Carl. *Toxic Torts: Science, Law and the Possibility of Justice*. Cambridge: Cambridge UP, 2006. 38.

generally caused by the product are often in question. Often, plaintiffs will marshal epidemiological evidence, which shows increases in a harm over a population, to illustrate that Substance X creates an elevated risk of Harm Y. Supplemental evidence can include chemical structure analysis, biologic mechanisms, animal testing, and comparisons to known toxic substances. The key part of general causation in that Substance X *can* cause Harm Y by elevating the risk of those exposed to it.

Once general causation is shown, specific causation is still a factor. Plaintiffs must show that not only *can* Substance X cause Harm Y, but that it *did* cause Harm Y in their case. Most harms caused by substances in toxic tort suits are not strictly caused by one factor, and a number of contributing factors can combine to increase a plaintiff's risk for a disease. For example, in the landmark case *Joiner vs. General Electric*, the plaintiff in question claimed that his lung cancer was due to occupational exposure to PCBs. However, the plaintiff was also a lifetime smoker. The confounding factor of the plaintiff's smoking made it more difficult to attribute his lung cancer development to PCBs.²⁴ The complex nature of causation for disease contributes to the difficulty of proving specific toxic tort claims. Specific causation evidence often takes the form of expert testimony about the plaintiff in question.

In both general causation and specific causation in tort cases, the standard of proof is preponderance of evidence or "more likely than not."²⁵ This means that plaintiffs both have to show that it is more likely than not that Substance X *can* cause Harm Y, and more likely than not that Substance X *did* cause Harm Y in the case in question.²⁶ This

²⁴ General Electric Company, et al., Petitioners v. Robert K Joiner et ux. 78 F.3d 524.

²⁵ *Wilson v. Johns-Manville Sales Corp.*, 684 F. 2d 111 (1982)

²⁶ Cranor, Carl. *Toxic Torts: Science, Law and the Possibility of Justice*. Cambridge: Cambridge UP, 2006. 39.

standard is also referred to as “fifty percent plus a feather,” in reference to the near equality of both sides.

Causation and Agent Orange:

Agent Orange lawsuits compound the difficulty of “proving” a causal claim. Dioxin, or TCDD, the specific compound in question, has been studied extensively and linked to a number of diseases. However, both lawsuits studied in this paper bring in massive classes of plaintiffs with numerous harm outcomes in question. Therefore, causation questions in both cases are best looked at through a test of three distinct evidence types, which are all required in order to show harm based on dioxin exposure.

1. Emissions: In what locations were Agent Orange or other herbicides containing dioxin used? In what quantity were the herbicides used? What dispersion methods? Examples of emissions models include the NAS 1974 study of HERBS data, or the Stellman update in 2003.
2. Exposure: Were the plaintiffs/class in question exposed to dioxin? What was the method and quantity of exposure? For Vietnam veteran exposure, troop movements, HERBS data and class depositions can be combined to approximate an exposure rating, but actual data about troop exposure is rare. For the Vietnamese plaintiffs, scientists tried to establish exposure by looking at food sources, ground and foliage contamination and existing levels of dioxin remaining in the bloodstreams of Vietnamese citizens.

3. Causation/Association: Is it more likely than not that the exposure of the plaintiff or class to the emission of dioxin via Agent Orange would result in increased risk of a disease or diseases? In the general case, this can take the form of epidemiological evidence combined with other forms of causal evidence, including but not limited to chemical structure analysis, biologic mechanisms, animal testing, and comparisons to known toxic substances. For specific causation, evidence often involves the testimony of doctors who treated the individual(s) in question.

All three categories are vital to both general and specific causal questions.

Part II: “Agent Orange” Product Liability Litigation, MDL No. 381 (1984)

History of “Agent Orange” Product Liability Litigation, MDL No. 381 (1984):

Origins:

The first major tangle involving Agent Orange, veterans, and the legal system came as a result of collaboration among a small group of veterans in Connecticut. Paul Reutershan, a former infantryman, had been working with lawyers to try to hold the chemical companies that produced Agent Orange liable for potential harm.²⁷ Reutershan’s attorney recruited Victor Yannacone, whose experience with DDT and workman’s compensation as well as his passionate commitment to “subduing toxic chemicals” made him uniquely qualified for a place on the legal team. Reutershan, deathly ill with cancer, turned the lawsuit over to his friend, fellow veteran and organizer Frank McCarthy, who saw the lawsuit as an important step in helping Vietnam veterans gain compensation for their suffering and made it a core element of his organization, Agent Orange Victims International (AOVI). Based on McCarthy’s activism and work, Yannacone rewrote the complaint as a class action, added a number of different potential conditions, and fired the first shot in the Agent Orange legal war.

On January 8th, 1979, the complaint filed by Yannacone named Dow Chemical Company, Hercules, Inc, Thompson Chemical Company, Monsanto Company, (later Diamond Shamrock Chemicals Company, Uniroyal, Inc., and T. H. Agriculture & Nutrition Company were added) as defendants who had harmed veterans and their families by negligently manufacturing and selling herbicides containing TCDD to the

²⁷ Schuck, Peter. *Agent Orange on Trial*. Cambridge, Massachusetts. Belknap Press of Harvard University Press. 1987. 41-43.

United States government. The plaintiffs claimed injuries including, but not limited to, chloracne, birth defects, soft tissue sarcoma, porphyria cutanea tarda (a disease that causes photosensitivity), other forms of cancer and miscarriages. Based on their claims of strict liability and negligence, the chemical companies were liable for harms to all veterans who had served the United States and been exposed to Agent Orange. The case was filed in New York, and then, as similar complaints were filed elsewhere, transferred to a Multi-District Litigation Panel under Judge George C. Pratt on account of the diverse potential venues and state laws that could be applied.²⁸

Consortium and Conflict:

In the months after the initial filing, Yannacone realized that the lawsuit, now encompassing numerous veterans from different parts of the country, was outside the scope of his ability to control by himself. He brought on both local Long Island lawyers and lawyers from across the country who had filed similar lawsuits to spread the work and the finances amongst a larger group. By September of 1979, Yannacone and associates were fully behind the lawsuit.²⁹ The lawsuit was an incredibly expensive proposition, and the lawyers worked together to control spiraling costs and recruit plaintiffs, despite many disagreements about how the case should be pursued.

At the case's heart was the question of whether Agent Orange caused the injuries claimed by the veterans. Without causal proof of dioxin's deadliness, the veterans did not have the ability to demand compensation from the chemical companies. Victor Yannacone had correctly realized that the case would hinge upon the causation connections, based on his workman's compensation experience. However, few of the

²⁸ Schuck, Peter. *Agent Orange on Trial*. Cambridge, Massachusetts. Belknap Press of Harvard University Press. 1987. 45-48.

²⁹ *Ibid*, 51.

others plaintiffs' lawyers in this case knew how to proceed with a case that would be won or lost on a scientific (or at least epidemiological) question. Most of the litigators involved were "trauma" lawyers; few had any experience with epidemiological work or even class actions. Yannacone compiled scientific papers on dioxin and offered to put together his own epidemiological study, with the assistance of his wife.

However, the other lawyers did not believe that the half million dollars that Yannacone would require were best used on providing their own causal evidence. It seems unlikely that Yannacone could have constructed a successful, scientifically valid epidemiological study out of his basement. Yannacone was often in conflict with the other lawyers about procedural issues and how to argue the case. Despite Yannacone's flaws, he was the first lawyer in the plaintiffs' case who concentrated on the requirements of causation. His proposed epidemiological study, however, had it been carried through, would have been of negligible value to the plaintiff's case.

The other lawyers' lack of experience with complex tort litigation may have contributed to the fact that they underestimated the need for more studies and information.³⁰ Conflict between Yannacone and the other members of the Plaintiffs Management Consortium (PMC) continued throughout the rest of the trial, with the eventual result that he was forced out as lead council. Given the stress, stakes, and money involved, disagreement was natural. Yannacone's actions and his investment as the "face of the case" often made it more difficult on the other lawyers.³¹

³⁰ Schuck, Peter. *Agent Orange on Trial*. Cambridge, Massachusetts. Belknap Press of Harvard University Press. 1987. 512

³¹ Schuck, Peter. *Agent Orange on Trial*. Cambridge, Massachusetts. Belknap Press of Harvard University Press. 1987. 108.

Rulings by Judge Pratt:

Early in the case, Judge Pratt made a number of important procedural rulings that came to define the outline of the case. Because the case was complicated to an extent that was almost unmanageable, he believed it should be run as a number of serial trials, each focusing on a specific, smaller issue and decided by a jury. The first trial would begin with the government contract defense, the most important part of the case in his eyes. The government contract defense is an extension of the sovereign immunity of the government meant to protect war-time suppliers from lawsuits. Pratt's government contract test had three parts –

- 1) The government had prepared the specifications for Agent Orange.
- 2) The defendant chemical companies had met them.
- 3) The chemical companies did not know any more, and at very most, were at knowledge parity with the government over the harmfulness of TCDD.

If the defendants could all prove all three portions of the test, they would have conclusively shown, in Pratt's view, that they could not be held liable for the injuries potentially caused by dioxin. Pratt set a June 20th 1983 trial date. Discovery under Pratt concerned only the government contract defense, and as such, was overseen by a special master, Sol Schreiber, with clearance to view government documents still classified from the war. The demand of showing knowledge parity meant that lawyers for the government, defendants, and plaintiffs poured through thousands of pages of reports about herbicide orders and testing. In Mid-March, the defendants asked for another year

to prepare for trial, alleging that the government had been stonewalling their attempts at proving their lack of liability. Pratt did not grant it.

In April, the case changed again. Initially, the defendants were convinced that they had to pursue the case, and thus the government contract defense, before a jury, as summary judgment would not be possible. However, Schreiber, the special master in charge of overseeing discovery, made a novel proposal. He encouraged the plaintiffs to allow the government contract defense to be tried before a court and not a jury in return for the agreement of a class certification of (b)(3), which let dissatisfied veterans opt out and pursue claims on their own. The class certification also relaxed the individual causation requirements. Most parties of both sides agreed, the class was certified, although never formally sent in, and the defense filed for summary judgment on the government contract defense.³²

On May 20th, 1983, Pratt dismissed some, but not all of the defendants' motion for summary judgment on the basis of the government contract defense. Riverdale, Hoffman-Taff, Hercules, and Thompson all were out of the case. However, there was not sufficient evidence that condition 3 could be met for the larger companies like Dow and Monsanto, and as such, the case would continue to trial. But this was not the biggest bombshell Pratt dropped on that day. He decided that the small, condensed, serial trials that he had earlier decided on was not good enough- and that the relevant issues all needed to be tried at once. Both sides were shocked and horrified- the trial was only a

³² Schuck, Peter. *Agent Orange on Trial*. Cambridge, Massachusetts. Belknap Press of Harvard University Press. 1987. 62.

year away, on June 27th, 1984, and they felt that they had little time to prepare for a full-scale, all issues jury presentation.³³

“Enter Judge Weinstein”:

On October 14th, 1983, 5 years into the trial process, Judge Pratt unexpectedly stepped down from the Agent Orange case. Pratt had been elevated to the Court of Appeals a year earlier, but had retained the case. In October, he decided that the workload was too much.³⁴ He was replaced by a young, wildcard judge named Jack Weinstein, a “liberal Democrat who unabashedly believed in activist government and judging.” No other single factor made as much difference in the outcome of this case.

In his first reversal Weinstein called the lawyers from both sides into chambers, and delivered a startling pronouncement- the case had changed. The government contract defense and the jury trials, Judge Pratt’s primary concern, was replaced with an emphasis on statistical evidence to prove causation. Yannacone’s initial hunch about the importance of epidemiological research had been vindicated. Instead of following Judge Pratt’s serial trial method, Weinstein wanted “the case promptly disposed of,” with jury selection to begin May 7th, 1984.³⁵

Weinstein loved challenging issues and legal frontiers, and was more than prepared to overthrow every ruling that Judge Pratt had already made about the tort issues and timeline involved in the case.³⁶ Weinstein reversed a number of decisions during his takeover of the case, including the class certification, the choice-of-law doctrine, Pratt’s

³³ Schuck, Peter. *Agent Orange on Trial*. Cambridge, Massachusetts. Belknap Press of Harvard University Press. 1987. 101.

³⁴ *Ibid.* 110.

³⁵ Schuck, Peter. *Agent Orange on Trial*. Cambridge, Massachusetts. Belknap Press of Harvard University Press. 1987. 113.

³⁶ *Ibid.*, 111.

use of *Feres-Stencel* to disallow third party claims against the government, and the order and method of trial procedure.

Throughout the case, he didn't let prior rulings stand in his way; in fact, he often "approached [rulings] as if the slate was entirely clean, as if Pratt had never decided the issue."³⁷ This allowed him to pull the government and the dismissed corporations back in. This methodology was challenged during appeals, but in the words of the appellate court that examined his decision to re-include the Government, "It is well established that the interlocutory orders and rulings made pre-trial by a district judge are subject to modification by the district judge at any time prior to final judgment, and may be modified to the same extent if the case is reassigned to another judge."³⁸

Weinstein's most important causation decision was the introduction of "representative plaintiffs," or cases that the plaintiffs felt were the *best* evidence for dioxin's negative health effects. Apparently, Weinstein had read about the idea in a recent article, and thought it might make the causal case less complicated. The plaintiffs settled on five types of claims:

1. Dermatological (chlorachne)
2. Systemic (for example, liver dysfunction)
3. Neurological (for example, peripheral neuropathies)
4. Cancers (for example, soft tissue sarcoma)
5. Birth defects

³⁷ Schuck, Peter. *Agent Orange on Trial*. Cambridge, Massachusetts. Belknap Press of Harvard University Press. 1987. 132.

³⁸ *In re* United States of America, Petitioner. in *Re "agent Orange" Product Liability Litigation*. 733 F.2d 10

Representative plaintiffs should exhibit as many of these characteristics as possible. In addition to epidemiological and statistical evidence, each plaintiff must be backed by a slew of expert witnesses who would testify that dioxin had caused their illnesses, showing specific causation.³⁹ The representative plaintiff decision made parts of the causation case easier, as it limited the scope of the specific causation questions, and a specific set of plaintiffs could make it easier for a jury to identify with the plight of the veterans.

Progress towards Settlement:

Weinstein was the first of the major players in the Agent Orange court case to express concerns about the long-term policy and political ramifications if the case was dismissed on a legal technicality.⁴⁰ He performed jurisdictional acrobatics upon taking the case in order to ensure that the case was either settled or went to trial, not dismissed on choice-of-law or governmental immunity. His reasoning was simple- the case had become larger than the individual legal claims, and it had come to represent a moral battle- to dismiss it would only entrench the two sides.

However, Weinstein was also clearly aware that the general causation evidence did not support the veterans' claims. The veterans might end up successful before a sympathetic jury, but at the time of the trial, there was not a preponderance of evidence showing that Agent Orange had caused the veterans injuries.

Thus, using the rapidly approaching trial date, Weinstein pushed the parties towards a settlement, bringing in Kenneth Feinburg, a lawyer who had been Senator

³⁹ Schuck, Peter. *Agent Orange on Trial*. Cambridge, Massachusetts. Belknap Press of Harvard University Press. 1987. 140.

⁴⁰ *Ibid.* 117.

Edward Kennedy's chief of staff, to construct a plan.⁴¹ Feinberg did not specify a dollar amount, but was responsible for laying out clear criteria by which to distribute the money and to hold each company accountable. By April 20th, 1984 Weinstein had used court funds to hire David O. Shapiro, another special master to work on the settlement.

Shapiro and Feinburg would need more than just a plan to accomplish the deal, as the initial estimate of compensation from the chemical companies was \$25 million and the plaintiffs were hoping for \$700 million.⁴² The defendants also wanted the government to pitch in a substantial amount of cash, which Shapiro pitched to the representative as the cost for the VA to cover health care, about \$42 million a year. Weinstein, Shapiro and Feinburg had one thing on their side- time. The case was scheduled to begin jury selection in less than a month, and the plaintiffs, the defendants, and the government were not ready. Thus, Shapiro and Feinburg determined between themselves to aim for an agreement between \$200-250 million, plus interest, and Shapiro went to work on the plaintiffs while Feinburg began to meet with the defendants.⁴³ This work continued as the trial date grew nearer and nearer.

The Last Hours:

The weekend before the trial was supposed to start, Weinstein, Shapiro, and Feinburg all went before each of the parties, reminding them of what they had to gain by settling. The plaintiffs could avoid the question of causation entirely, and not risk their case on statistical evidence, and the defendants could minimize the chance of a catastrophically high cost jury verdict. In order to prevent endless intra-defendant arguing

⁴¹ Schuck, Peter. *Agent Orange on Trial*. Cambridge, Massachusetts. Belknap Press of Harvard University Press. 1987. 144

⁴² *Ibid.* 145,147.

⁴³ *Ibid.* 152.

about market share, dioxin content, and liability, Weinstein made a last minute decision that the percentage of the settlement would be determined by a combination of product volume and TCDD content, leaving Monsanto and Dow with the largest parts of the pie. Hours of argument passed by, with proposal after counterproposal, and still the defendants were stuck at \$180 million, and the plaintiffs at 200. Judge Weinstein himself, actually, supported the \$180 million figure, but reminded Shapiro to tell the plaintiffs that the interest would bring them the additional boost that they needed. It was the Sunday afternoon before a Monday trial. Judge Weinstein, activist judge to his core, intervened. Benton Musselwhite, a lawyer as part of the coalition, recalled his speech thus,

“I have carried you plaintiffs all this time. I have decided a lot of questions in your favor that I could have decided the other way. And I want you to know that at nine o’clock Monday morning, I am through carrying you. You are on your own. I will do my duty as a judge.”⁴⁴

By Sunday night, the PMC had agreed. Thompson Chemicals, the last hold out on the side of the defendants, finally relented. The settlement clock would begin ticking on Monday morning, for \$180 million in 1984 dollars, or approximately \$366 million in 2009 dollars. It was the single largest class action settlement in United States history to date.

Causation in “Agent Orange” Product Liability Litigation, MDL No. 381 (1984):

Emissions:

Limited evidence existed about emissions during the 1979-1984 lawsuit period. The primary record was the 1974 NAS study which was aimed at reconstructing

⁴⁴ Schuck, Peter. *Agent Orange on Trial*. Cambridge, Massachusetts. Belknap Press of Harvard University Press. 1987. 150

environmental damage, and combined HERBS tape data with procurement records and aerial photography.⁴⁵ The primary purpose of the NAS study was to estimate environmental damage based on the vegetation type the herbicide was used on, not to calculate total coverage; however, its final estimate was that,

“...about 3.600,000 acres were sprayed...About 2,370,000 or 66 percent of the sprayed areas were sprayed once, about 800,000 acres or 22 percent twice, about 280,000 or 8 percent three times, and about 130,000 acres or 4 percent four or more times.”⁴⁶

The NAS study calculated these numbers based on a nominal amount of area covered per flight, not attempting to reconstruct drift patterns and/or foliage penetration. Furthermore, the data laid out did not account for changes in direction during the missions or discontinuous targets. During the active period of the lawsuit, no comprehensive studies existed about ground troop usage of herbicides, or about Vietnamese population exposure.

Exposure:

Given the lack of accurate data about emissions, predicting the exposure of veterans who served as ground troops and not Ranch Handlers was incredibly difficult. Various efforts were made to create indices that would evaluate the likelihood that a given veteran had been exposed. The CDC, in order to construct the 1984 birth defects study, used estimates by military records specialists to create an exposure opportunity index (EOI). (Appendix 1) Index scores of 1 (least exposed) -5 (most exposed) were

⁴⁵ Committee on the Effects of Herbicides in Vietnam, National Research Council. *The Effects of Herbicides in South Vietnam: Part A- Summary and Conclusions*. Washington DC. National Academy of Sciences. 1974.

⁴⁶ Committee on the Effects of Herbicides in Vietnam, National Research Council. *The Effects of Herbicides in South Vietnam: Part A- Summary and Conclusions*. Washington DC. National Academy of Sciences. 1974. III-18.

assigned based on service locations and tasks. All veterans were given two scores, one based on their own personal reported service and one based on military unit location data. In 52% of cases, veterans received the same score from the military unit as they gave themselves. Similarly, veterans who thought they had been exposed were more likely to receive scores of 4 or 5, meaning that in most cases, self-exposure identification was at least somewhat accurate.⁴⁷

The Centers for Disease Control also produced another index to measure exposure for the Agent Orange study, which was specific to long-term health effects of Vietnam veterans (AOS). These scores “attempted to account for variations in TCDD half-life, dispersion of herbicides, error in the calculated distances from spray lines, and uncertainties regarding the time before spraying and possible exposure.” This exposure index was not complete as of the 1985 settlement.

Biomarkers and adipose tissue testing was still prohibitively expensive in 1985. The one completed adipose testing study by Michael L. Gross et al used 30 tissue samples supplied by the VA. It reported the TCDD levels of 20 Agent Orange exposed veterans, extracted by gas chromatography and high resolution mass spectrometry, and found that there was a correlation between VA-claimed exposure (Ranch Handers) and high body levels of TCDD.⁴⁸

However, despite these attempts at codifying exposure levels, the majority of veterans and thus the majority of class members in the 1985 settlement were not rated for

⁴⁷ IOM (Institute of Medicine.) *Veterans and Agent Orange: Health Effects of Herbicides Used in Vietnam*. Washington, DC: The National Academics Press. 1991. 276.

⁴⁸ Michael L. Gross, Jackson O. Lay Jr., Philip A. Lyon, Dixie Lippstreu, Nancy Kangas, Robert L. Harless, Scott E. Taylor, Aubry E. Dupuy Jr., “2,3,7,8-Tetrachlorodibenzo-p-dioxin levels in adipose tissue of Vietnam veterans”, *Environmental Research*, Volume 33, Issue 1, February 1984, Pages 261-268.

exposure, and service records were only examined for veterans actively participating in studies. As such, it was difficult to determine how widespread Agent Orange exposure was among the veteran population. Based on the data that existed in the early 1980s, it was likely that veterans who believed that they were heavily exposed, either by ground spraying or being in heavily forested areas, did indeed have a higher rate of exposure. However, the exposure of ground troops who were uncertain about their own relationship to Agent Orange was still questionable.

Association:

The five representative plaintiff categories accounted for the harm outcomes that the plaintiffs believed they could show were due to dioxin exposure. However, at the time of the trial, there was very little general causation evidence that suggested that dioxin could cause these outcomes, let alone that it did in the specific cases of the representative plaintiffs.

The first major study undertaken of TCDD exposure in the veteran population was the Ranch Hand study, begun in 1982. It was a retrospective matched cohort study design, examining both morbidity and mortality. In a retrospective matched cohort study, the exposed group is matched against a control population. In this case, the already exposed Ranch Handers were matched against control populations with the same age and socio-demographic make up, and then follow-ups were performed every two years till 2002.⁴⁹ There were 1269 starting participants, and a control group of 1,688 picked out of

⁴⁹ IOM (Institute of Medicine.) *Veterans and Agent Orange: Health Effects of Herbicides Used in Vietnam*. Washington, DC: The National Academics Press. 1991. 386.

a population of 24,971 aircraft crew members who served in other parts of Southeast Asia. Controls were matched on age, job type, and white/not white.

Ranch Handers were the ideal population for a dioxin related study because their combat positions produced a higher level of exposure compared to that of the average veteran, and thus questions of exposure index were reduced. The group was, as mentioned earlier, split into various categories, but this study still represented a significant improvement in modeling exposure over other attempts. At the time of the settlement, the study had completed a baseline mortality and morbidity study, and a first follow-up examination.⁵⁰ The baseline mortality report stated, “mortality experience of the Ranch Hand group is nearly identical to that of its comparison group. However, this mortality report can in no way be regarded as conclusively negative since the study population may not have reached the latency period.”⁵¹ Latency period refers to the gap between exposure to dioxin and development of any symptoms.

The morbidity report concluded that there was “insufficient evidence to support a cause and effect relationship between herbicide exposure and adverse health in the Ranch Hand group at this time.”⁵² The baseline report did contain oddities- increased rates of physical handicaps and neonatal deaths, but no cases of chloracne; however, it did not show significant evidence of increases in disease.⁵³

⁵⁰ Ibid. 385.

⁵¹ Lathrop, George D.; Moynahan, Patricia; Albanese, Richard; Wolfe, William; Air Force Health Study. An Epidemiologic Investigation of Health Effects in Air Force Personnel Following Exposure to Herbicides: Baseline Mortality Study Results. 1983.

⁵² Ibid. 1984.

⁵³ Ibid, ii.

The other major study released at the time of the settlement was the Centers for Disease Control's birth defects study, a case control interview study designed to determine if birth defect rates were higher among dioxin-exposed Vietnam veterans.

It was done in Atlanta through the Metropolitan Atlanta Congenital Defects Program, a set of existing records, and only included cases with serious or major birth defects.⁵⁴

Cases were first identified by searching hospital records, and put into categories based on defect. In total, 7,133 births were eligible for the study, and the parents were interviewed, and they were compared with 323,421 live, defect-free births.

An exposure opportunity index (EOI) was created to account for parental Agent Orange exposure, and confounding factors (alcohol consumption, maternal age) were considered. The findings, as listed in the IOM summary, were that "No association was noted between Vietnam veteran status or self-reported Agent Orange exposure and risk of fathering a child with multiple birth defects"; however, there was a significant trend of increased risk of spina bifida with increased EOI. The study did have some weaknesses, in that response rates for interviews were only at about 56%, and many interviews took place years after births.⁵⁵ The CDC birth defects study was helpful evidence for the plaintiffs that some birth defects might be causally associated with Agent Orange.

There were other, non-epidemiological studies completed by the time of the settlement. Most of the animal studies had focused on high dose topical or exposure,

⁵⁴ Erickson JD, Mulinare J, McClain PW, Fitch TG, James LM, McClearn AB, Adams MJ, Jr. 1984a. "Vietnam Veterans' Risks for Fathering Babies with Birth Defects." Atlanta: US Department of Health and Human Services, Center for Disease Control.

⁵⁵ IOM (Institute of Medicine.) *Veterans and Agent Orange: Health Effects of Herbicides Used in Vietnam*. Washington, DC: The National Academics Press. 1991. 612.

specifically in mice, and many found increases in tumors of the thyroid, liver or skin.⁵⁶

The animal studies showed a clear pathway for tumor development, however, as Weinstein noted in the Fairness Opinion, the dose level for animals was much higher than any of the humans exposed.

Causation Analysis:

The primary difficulty with causation in *In re 'Agent Orange' Product Liability Litigation* was the shortage of finished research available by the discovery period of the trial. Herbicide spraying had ceased in 1971, and dioxin had not been considered a health threat until the late 1970s. Epidemiological data collection takes significant time, especially for chemicals without signature diseases, and the difficulty of showing accurately inferring exposure only compounded the already problematic lack of completed research. Judge Weinstein was clearly aware of this fact, and indeed, understood better than most actors in the case what kind of uphill battle the plaintiffs had taken on. However, his feelings on the matter were clear: if the plaintiffs could not produce the data, they should not have brought the case.⁵⁷ In his Fairness Opinion, issued after the settlement, he lays out the fact that as the judge in a court of law, he must decide immediately whether there is a causal link between Agent Orange and the proposed diseases, even if there is not sufficient evidence to draw a conclusion yet: “Courts cannot, unfortunately, wait indefinitely until all scientists have completed their long term studies. They must decide on information now available.”⁵⁸

⁵⁶ IOM (Institute of Medicine.) *Veterans and Agent Orange: Health Effects of Herbicides Used in Vietnam*. Washington, DC: The National Academics Press. 1991. 117.

⁵⁷ Schuck, Peter. *Agent Orange on Trial*. Cambridge, Massachusetts. Belknap Press of Harvard University Press. 1987. 113.

⁵⁸ Weinstein, Jack. Fairness Opinion. “Agent Orange” Product Liability Litigation, MDL No. 381, 597 F. Supp. 740 (1984). United States District Court Eastern District Of New York.

Within the plaintiffs' legal team, there were two different views on how the causation case should function. Tom Henderson, a Pittsburgh lawyer brought in once the case had already started, believed that animal evidence was the key towards general causation. His asbestos experience had taught him to look for one key disease marker, which in the case of dioxin, he identified as chloracne, and use animal studies to show systematic toxicity from there. Yannacone, on the other hand, believed that epidemiological evidence, most notably the study he was conducting, would show the general causation case. When Yannacone was driven out in September, 1973, Henderson took over the causation argument, which could explain the desire to go ahead without epidemiological evidence supporting the plaintiffs' conclusions.⁵⁹

Weinstein was certainly not convinced by the causation case that the plaintiffs marshaled, even under a weak interpretation of the preponderance of evidence rule.⁶⁰ He notes that unlike in previous cases where statistical and epidemiological evidence had been relied upon to construct causal arguments (DES and asbestos), dioxin exposure had no tell-tale disease. In his words, "the evidence provided by the plaintiffs to date on general causality, while supportive of the desirability of further studies, lacks sufficient probative force- except in the case of chloracne- to permit a finding of general causality."

It is important to note that Weinstein is basing this opinion on his own understanding of the scientific evidence, the "Distribution and Administration of the Settlement Fund," and the depositions of expert witnesses taken during discovery. The plaintiffs, under the terms of the settlement, were never required to present their

⁵⁹ Schuck, Peter. *Agent Orange on Trial*. Cambridge, Massachusetts. Belknap Press of Harvard University Press. 1987. 108-110.

⁶⁰ Weinstein, Jack. *Fairness Opinion*. "Agent Orange" Product Liability Litigation, MDL No. 381, 597 F. Supp. 740 (1984). United States District Court Eastern District Of New York. 835.

causation case in court, and the defendants, curiously, never moved for summary judgment on causation.⁶¹

Based on a review of the available evidence at the time of the settlement/proposed trial start date, Weinstein was correct in his analysis that the causation case for the plaintiffs just wasn't there. Under Henderson's model, which primarily relied upon animal studies and other forms of non-epidemiological data, the plaintiffs might have been able to show that dioxin had harmful effects, but that hardly suited the level of causal rigor demanded by Weinstein. Thus, the decision of the plaintiffs and defendants to settle pushed back the issue of what diseases dioxin exposure actually caused, for revisiting in later cases.

⁶¹ Weinstein, Jack. Fairness Opinion. "Agent Orange" Product Liability Litigation, MDL No. 381, 597 F. Supp. 740 (1984). United States District Court Eastern District Of New York. 782.

**Tort Law in “Agent Orange” Product Liability Litigation, MDL No. 381 (1984):
Indeterminate Plaintiff:**

The problem of the indeterminate plaintiff is a problem to a certain extent unique to the mass toxic tort. In a normal tort suit, individual plaintiffs provide evidence for the harms that they claim the defendants have caused. In a class action lawsuit, it is impossible to provide specific causation information for each plaintiff. Accordingly, only general causation is required for the mass plaintiff; otherwise it would be impossible to show a preponderance of evidence for each case. In evaluating the evidence presented by the plaintiffs, Weinstein had a choice between a strong preponderance of evidence rule and weak preponderance of evidence rule.

Under a strong version of the preponderance of evidence rule, even if general causation was almost certain, specific causation would need to be proven on a case-by-case basis, by what Weinstein calls “particularistic evidence” or anecdotal data, a specific link between the plaintiff and the defendant’s tortious conduct. To a certain extent, the strong preponderance rule also shows up in the case- in the form of the representative plaintiffs. The weak version of the preponderance of evidence rule requires only statistical evidence. As Rosenberg notes in “The Causal Connection in Mass Exposure Cases, ” “‘Particularistic’ evidence, however, is in fact no less probabilistic than is the statistical evidence that courts purport to shun ‘Particularistic’ evidence offers nothing more than a basis for conclusions about a perceived balance of probabilities.”⁶²

Rosenburg is confronting the essential problem of showing individual causation- that even in cases where a John Doe had a risk of X before exposure and a risk of 2X after,

⁶² Weinstein, Jack. Fairness Opinion. “Agent Orange” Product Liability Litigation, MDL No. 381, 597 F. Supp. 740 (1984). United States District Court Eastern District Of New York. 836.

that still only confers an increased probability that he will encounter harm Y, and not a guarantee. Weinstein uses this view of specific evidence to support his usage of the weak preponderance rule, which he argues is the best of all possible outcomes. Weinstein solves the problem of the indeterminate plaintiff with the weak preponderance rule, using a “single, class wide determination of total harm to the community of plaintiffs.”⁶³

Indeterminate Defendant:

The problem of the indeterminate defendant was, in this case, both an artifact of the peculiar historical circumstances of the Agent Orange cases and a larger issue in product liability or toxic tort cases. An indeterminate defendant problem is one where the plaintiffs cannot point to a specific defendant out of a group that caused their injury.

Indeterminate defendants can exist in a variety of circumstances, from drug production to arms manufacturers. In the case of Agent Orange, the mixing of each individual company’s product into identical barrels destroyed the connection between the defendant who produced the product and the plaintiffs who might have exposed to the substance, both for plaintiffs who directly handled the chemicals and those who were on the ground when it was sprayed. Plaintiffs had no means to determine which company to hold liable for their injuries.

Judge Weinstein dealt with the indeterminate defendant problem in a relatively unique way. The plaintiffs proposed that if they successfully proved the first three aspects

⁶³ Weinstein, Jack. Fairness Opinion. “Agent Orange” Product Liability Litigation, MDL No. 381, 597 F. Supp. 740 (1984). United States District Court Eastern District Of New York. 839.

of the *prima facie* case of traditional product liability law,⁶⁴ they should no longer need to prove the fourth. Allowing this would require a number of preconditions. First, the defendants acted in a parallel fashion in allowing the dioxin in their products, and the independent acts of several defendants caused this harm. Third, all defendants individually failed to perform the duty to warn. Weinstein did not follow any existing liability principle to establish this, but created a unique case rule: that the burden of proof will shift to the defendant if the plaintiff can show that the defendant failed in their duty to warn the United States government about the dangers of their or another defendant's product. Defendants can also become un-liable by showing that their Agent Orange did not contain harmful substances, or by using the government contractor defense.⁶⁵

Once the settlement became a consideration, questions of market share and fairness came into play. Not all producers were responsible for the same amount of Agent Orange, and the allocation criteria of liability became a primary concern for defendants. Three different methods were proposed: dioxin content, preferred by Dow and Hercules; market share, favored by Monsanto and Diamond Shamrock; and ability to pay, preferred by the smaller companies.⁶⁶ Each method of allocating responsibility would have resulted in substantially different costs for the companies, and they were at impasse. Finally, the companies turned to Judge Weinstein to negotiate a compromise. He determined that the allocations should be determined based on a combination of product volume and dioxin

⁶⁴ The four *prima facie* qualifiers are that plaintiff was injured, by Agent Orange, and that the defendant had a duty to warn the plaintiff, and finally, that the Agent Orange that hurt the plaintiff was manufactured by the defendant. See Appendix 2 for more details.

⁶⁵ Weinstein, Jack. Fairness Opinion. "Agent Orange" Product Liability Litigation, MDL No. 381, 597 F. Supp. 740 (1984). United States District Court Eastern District Of New York. 833.

⁶⁶ Schuck, Peter. Agent Orange on Trial. Cambridge, Massachusetts. Belknap Press of Harvard University Press. 1987. 155.

content. For companies with higher dioxin content than average, they were responsible for paying a higher percentage than their market share, and the converse as well.⁶⁷

Feres-Stencel and Government Involvement:

The *Feres-Stencel* doctrine is an extension of the usual sovereign immunity of the Government in court. *Feres vs. United States* was a 1950 Supreme Court case in which the Court upheld the government's immunity from suit for injuries sustained during service in the armed forces that result from negligence by other members of the armed forces. The cases cited in the decision primarily had to do with medical malpractice by army surgeons, for which the government was not held liable. Obviously, *Feres* has an important role in the maintenance of discipline of the armed services, as soldiers being able to sue for negligence on the part of their commanders would represent a significant problem.⁶⁸

The *Feres* doctrine was extended in 1977, when the court ruled in *Stencel vs. United State* that third party indemnity claims in which a contractor pulled in the United States government despite *Feres* immunity were also not allowed. This was a compromise between *United States v. Yellow Cab Co.*, where it was ruled that the government could be introduced as a third party if it was "wholly or partially responsible for the plaintiff's injury" and the previous *Feres* doctrine.⁶⁹ *Yellow Cab* meant that manufacturers of products used by the government could be pulled into court cases where

⁶⁷ Schuck, Peter. *Agent Orange on Trial*. Cambridge, Massachusetts. Belknap Press of Harvard University Press. 1987. 156.

⁶⁸ *Stencel Aero Engineering vs. United States*, 431 US 666 (1977), *Feres v. United States*, 340 U. S. 135.

⁶⁹ *Stencel Aero Engineering vs. United States*, 431 US 666 (1977)

their products were at fault, but *Stencel* allows for them to defend against liability by showing that they were not entirely responsible for the outcome of the product.

Judge Pratt had ruled that according to *Feres-Stencel*, the government was out of the case by December, 1980. *Stencel* meant that the government could not be pulled into the case by its own contractors. However, Judge Weinstein brought the government back in by postulating the wives claiming that their husbands' exposure to the herbicide damaged their sperm was a direct claim, and thus, overturned Pratt's ruling. His precedent was dubious at best- the dissent from *Stencel* and another case against *seven* circuit court decisions. Weinstein's attempt to drag the government, kicking and screaming, back into the case also made the government contract defense more complicated- whereas Pratt's summary judgment had ruled in favor of the defense on the first two parts, they were now back up for debate.⁷⁰

Tort Law Conclusions from the 1985 Settlement:

In 1985, many of the metrics Judge Weinstein used were revolutionary and controversial. Weak preponderance rules were an aspect of the academic literature, not a commonly used tort tool, and proportional liability was still a new concept. This was in part an issue of the scope of lawsuits, as asbestos and DES, the first large toxic tort suits, were just finishing when the Agent Orange lawsuits began. Judges had not figured out how to handles issues of indeterminate plaintiffs, and the government contract defense with regards to Agent Orange had not been fully explored. The 1985 settlement allowed Weinstein to provide recommendations to future judges about how to handle the

⁷⁰ Schuck, Peter. *Agent Orange on Trial*. Cambridge, Massachusetts. Belknap Press of Harvard University Press. 1987. 135-138.

complicated tort issues without requiring a true legal test- the fairness opinion was Weinstein's memorandum to the future toxic tort judge. Over the years that followed, cases like Bendectin would test the limits of the courts to handle tort law. In the 2004 VAVAO case, Weinstein received an opportunity to revisit the questions he had attempted to answer in 1985.

Part III: *VAVAO vs. Dow Chemical, Monsanto et al. (2004-2008)*

History of *VAVAO vs. Dow Chemical, Monsanto et al.*

2004 VAVAO Complaint:

In 2004, the question of Agent Orange in Vietnam returned to the news. On September 10th, an organization called the Vietnam Association for Victims of Agent Orange/Dioxin (VAVAO) filed suit against the same set of manufacturers. Under the Alien Tort Claims Act (ACTA), they claimed that the chemical companies had “aid[ed] and abet[ted] violations of international law and war crimes,” and sought “money damages for personal injuries wrongful death and birth defects” as well as injunctive relief.⁷¹

The VAVAO was a non-profit, non-governmental organization that consisted primarily of “victims of exposure to herbicides” and they brought suit on behalf of all Vietnamese harmed by Agent Orange. A specific set of plaintiffs was chosen, much like the representative plaintiffs of the 1984 suit, who demonstrated a number of the conditions that the complaint claimed were caused by Agent Orange.⁷² They further claimed in the complaint that the herbicide use in Vietnam was a program of “chemical

⁷¹ “Agent Orange” Product Liability Litigation, Complaint. MDL No. 381, 04-CV-400, United States District Court Eastern District Of New York, VAVAO vs. Dow Chemicals, Monsanto et al, pg. 4.

⁷² “Agent Orange” Product Liability Litigation, Complaint. MDL No. 381, 04-CV-400, United States District Court Eastern District Of New York, VAVAO vs. Dow Chemicals, Monsanto et al, pg. 6.

warfare,”⁷³ and the complaint listed numerous examples of advocacy groups within the United States that wished to stop the spraying of herbicides.⁷⁴

The bulk of the complaint centered on the knowledge that the herbicides would be used “in herbicidal/chemical warfare, in violation of international law,” and that the defendant chemical companies,

“...were aware at the time of procurement and production that dioxin was a by-product and contaminant of 2,4,5-T, that dioxin was extremely toxic to plants, animals and humans and that it would cause injury and death to the plaintiffs and others similarly situated.”⁷⁵

Following that are numerous cases in which the defendant chemical companies could (and should) have gained knowledge of the nature of dioxin. The evidence presented in the brief contradicts, to a certain extent, the findings in the 1984 case about the relative knowledge of each company during the production period. Furthermore, the complaint claimed that the “defendant’s unlawful conduct” was “malicious, fraudulent...and done with a willful and conscious disregard for plaintiff’s rights.”⁷⁶ The list of laws that the defendants allegedly violated was extensive (Appendix 3). The plaintiff’s list of questions of fact and law also included general causation questions but interestingly, not specific ones, despite the obvious problem of proving causation in a class that numbered over 3 million. In the case of the veterans, at least Vietnam service

⁷³ “Agent Orange” Product Liability Litigation, Complaint. MDL No. 381, 04-CV-400, United States District Court Eastern District Of New York, VAVAO vs. Dow Chemicals, Monsanto et al, pg. 13.

⁷⁴ Ibid, 15-18.

⁷⁵ Ibid, 22.

⁷⁶ Ibid, 51.

could be used as a clearly defined test for inclusion in the class, but in this lawsuit, there was no such qualifying factor⁷⁷

The complaint closes with a “prayer for relief,” which includes a number of different damages, including compensatory, punitive, injunctive, and declaratory relief, that would provide for “environmental abatement and remediation of *all* contaminated areas in Vietnam,” (emphasis added) and return of all profits, with interest from first procurement contract, made by the defendants throughout the course of herbicide sales.⁷⁸ The case was given to Judge Jack Weinstein, again, because of his superior knowledge about Agent Orange and its legal history.

Petition for Dismissal:

The defendants filed an incredulous Motion to Dismiss quickly after the complaint. The major premise was that a lack of justiciable claims in the complaint made it impossible to adjudicate and that the plaintiffs failed state forms of relief that would satisfy the claims made in the complaint. The defendants also made a motion for partial summary judgment based on the applicable statute of limitations.

In this context, justiciability referred to the ability of a court to rule on a set of issues in a way that would not impair the powers of the other branches of government. From *Japan Whaling Ass’n v. Am. Cetacean Soc’y*, 478 U.S. 221, 230 (1986), justiciability “excludes from judicial review those controversies which revolve around policy choices and value determinations constitutionally committed for resolution to the

⁷⁷ “Agent Orange” Product Liability Litigation, Complaint. MDL No. 381, 04-CV-400, United States District Court Eastern District Of New York, VAVAO vs. Dow Chemicals, Monsanto et al, pg. 54.

⁷⁸ “Agent Orange” Product Liability Litigation, Complaint. MDL No. 381, 04-CV-400, United States District Court Eastern District Of New York, VAVAO vs. Dow Chemicals, Monsanto et al, pg. 68.

halls of Congress or the confines of the Executive Branch.” The plaintiffs’ request for relief included “environmental abatement and remediation,” but also punitive damages to be paid by the companies in the form of reparations. As the defense pointed out, even the word reparations is typical of interactions between states, not between parties in a lawsuit. The defendants stated that the payment of reparations by the chemical companies, if enforced by the courts, would require “this Court to impermissibly second-guess the wisdom of core military and diplomatic decisions and could interfere with present sovereign-to-sovereign relations between the United States and Vietnam.”⁷⁹

The defendants elaborated upon each of the individual international and national laws that had allegedly been violated and claimed that they were not applicable for a host of specific reasons. For example, the defendants claimed that the application of the Torture Victim Protections Act (TVPA) is incorrect as 1) the TVPA does not apply to corporations and the harm must be perpetrated on individuals, 2) the alleged acts of torture did not occur while plaintiffs were in custody of physical control of the defendants, 3) the defendants did not act under authority of a foreign government, and 4) there was no basis to claim that the defendants fall under the definition of civil aiding and abetting.⁸⁰ These types of claims are repeated for the other laws the plaintiffs claim the defendants have violated.

⁷⁹ “Agent Orange” Product Liability Litigation, Motion to Dismiss. MDL No. 381, 04-CV-400, United States District Court Eastern District Of New York, VAVAO vs. Dow Chemicals, Monsanto et al. pg. 20.

⁸⁰ Ibid 21-25.

Judge Weinstein’s Dismissal:

In March of 2005, Judge Weinstein came down with a ruling. In it, he agreed with most of the claims that the defendants made in their motion to dismiss.⁸¹ First, he cited a number of the opt-out cases from the original (1984) Agent Orange litigation to show the invalid nature of domestic tort claims under the government contract defense.

Specifically, *Isaacson v. Dow Chem. Co.*, 304 F. Supp. 2d 404 (E.D.N.Y. 2004), which granted dismissal based on government contractor defense and *In re “Agent Orange” Prod. Liab. Litig.*, 818 F.2d 187 (2d Cir. 1987), where it was held that the government contractor defense applied, and also that there was insignificant evidence for causation.⁸² Based on this case law, Weinstein identified the domestic tort aspect of the 2004 VAVAO case as dismissed, claims (e) – (j) from Appendix 4. In addition, claims (k), (l) and (m) were dismissed on the same government contractor grounds, as they are claims that fall within domestic United States law.⁸³

However, the unexplored international law claims, which had not been tested by any of the opt-out cases, still remained (claims (a) – (d)). The United States had filed a amicus brief stating that the international claims against the defendants should also be dismissed on the same grounds. Weinstein disagreed with the government’s belief that the international claims should also be dismissed under the government contract defense, based on Nuremberg and other post-World War II trials, including the *Zyklon B Case (Trial of Bruno Tesch and Two Others)*.

⁸¹ “Agent Orange” Product Liability Litigation, Memorandum, Order and Judgment, MDL No. 381, 04-CV-400, United States District Court Eastern District Of New York, VAVAO vs. Dow Chemicals, Monsanto et al, pg. 11.

⁸² *Ibid.* 12.

⁸³ *Ibid.*, 66.

At the same time, Weinstein did agree with the government's brief that herbicide use was not a war crime or more generally, a crime at all in 1971, the last year of Agent Orange spraying.⁸⁴ He then explored each of the statutes of the United States upon which the plaintiffs claim relief, to determine if any of them represent valid claims. He found that each statute – the TVPA, the War Crimes Act of 1996, and the Genocide Convention Implementation Act of 1987 all do not apply, as the specific content of each statute as currently enforced excludes the method of harm.⁸⁵ The claims based on the treaties addressed, including the 1907 Hague Convention, the 1925 Geneva Protocol, the 1945 London Charter, the UN Charter, and the 1949 Geneva Convention, are all dismissed on the grounds that they either did not historically refer to herbicides, or the use of herbicides fell within the grounds of a legal act of war with unfortunate civilian consequences (such as shelling.)⁸⁶

The 1969 UN General Assembly Resolution, the most relevant cited international document, directly condemned the use of herbicides in Vietnam. As Weinstein pointed out, however, it is not a binding international law, and the General Assembly is not a law making body. Further, environmental law norms, the last of the international basis for claims, were not a citation of any specific convention or legal instrument. Weinstein did note that there was no treaty or custom before 1975 that outlawed the use of herbicides.⁸⁷

⁸⁴ “Agent Orange” Product Liability Litigation, Memorandum, Order and Judgment, MDL No. 381, 04-CV-400, United States District Court Eastern District Of New York, VAVAO vs. Dow Chemicals, Monsanto et al, pg. 171.

⁸⁵ “Agent Orange” Product Liability Litigation, Complaint. MDL No. 381, 04-CV-400, United States District Court Eastern District Of New York, VAVAO vs. Dow Chemicals, Monsanto et al, pg. 175-181.

⁸⁶ Ibid, 181-196.

⁸⁷ Ibid, 202.

The last set of bases for claims is “customary international law,” “crimes against humanity,” and “proportionality.” All three were dismissed, on similar grounds as the previous international conventions, namely that no laws or, indeed, international consensus consisted condemning the use of herbicides in military situations.⁸⁸ At the end of this exhaustive treatment of each basis to claims, Weinstein had dismissed all of the list of laws violated presented in the complaint (Appendix 4). Therefore, the suit was dismissed.⁸⁹

Appeals:

VAVAO vs. Dow Chemicals, Monsanto et al was appealed to the Second Court of Appeals, argued on June 18th, 2007, and decided on February 22nd, 2008. The plaintiffs appealed on three major grounds, first that the Alien Tort Statute (ATS) did indeed apply because the defendants violated international law norms. Secondly, the plaintiffs did not agree with Weinstein’s invocation of the government contract defense based on the previous discovery in opt-out cases, as they felt more discovery on Agents White and Blue were necessary. Finally, they did not agree with dismissal of injunctive relief claims.⁹⁰

The first claim, which fall grant of the defenses under motion to dismiss, was reviewed under Rule 12(b)(6), which construes the facts in favor of the non-moving party. Denial of leave to conduct discovery, the second claim, and the third claim were

⁸⁸ “Agent Orange” Product Liability Litigation, Complaint. MDL No. 381, 04-CV-400, United States District Court Eastern District Of New York, *VAVAO vs. Dow Chemicals, Monsanto et al*, 215-221.

⁸⁹ *Ibid*, 233.

⁹⁰ United States Court of Appeals for the Second Circuit Decision. 05-1952-cv. *VAVAO vs. Dow Chemicals Co.* 17-18.

reviewed under an abuse of discretion standard.⁹¹ The court concurred with both motions to dismiss, based on similar analysis to Judge Weinstein, on the lack of applicability of the international law norms cited, and the use of a herbicide's failure to satisfy the *Sosa* standard for recognition of a violation of international law.⁹² The Second Circuit of Appeals agreed with the District Court about the adequacy of previous discovery, and the failure to state claims under which injunctive relief could be granted. Therefore, they affirmed Judge Weinstein's decision in the District Court. The case was appealed to the Supreme Court by the plaintiffs, but was denied a writ of certiorari.

Causation in *VAVAO vs. Dow Chemical, Monsanto et al. (2004-2008)*:

The causation evidence laid out in the initial documents submitted by the plaintiffs is confusing, at best. Causation took the form of a number of stories about plaintiffs, similar in many ways to the representative plaintiffs of the 1984 settlement case, but lacking the attempts to prove general causation present in that lawsuit.

Emissions:

Emissions evidence is laid out in the form of numbered items within the factual allegations made by the plaintiffs. For example,

“60. Between 1961 and 1971, at least 19,905 sorties were run by the USAF. 1- 34 sorties were run daily, with a daily average of 10.7 sorties.

⁹¹ United States Court of Appeals for the Second Circuit Decision. 05-1952-cv. *VAVAO vs. Dow Chemicals Co.* 19.

⁹² United States Court of Appeals for the Second Circuit Decision. 05-1952-cv. *VAVAO vs. Dow Chemicals Co.* 23-24.

1968 and 1969 were the peak years for herbicide spraying under Ranch Hand....”⁹³

First the plaintiffs brought in evidence that stated defoliation began in September 1962, and then crop destruction began 2 months later. Herbicide use escalated in 1964, and was used extensively against supply routes by the Vietnamese army, as well as the Mekong Delta and the area surrounding military bases. The complaint also cited the Stellmann study to note that the spraying from 1961-1971 exceeded 76 million litres.⁹⁴ All of this is in line with the most recent information available in 2004-2005.

Exposure:

Exposure evidence was first illustrated on a specific causal level. The complaint illustrated the method by which each of the individual plaintiffs could have become exposed to dioxin. For example, Dr. Phi Phi, the first plaintiff, alleged that she ate food and drank water contaminated by dioxin while working at a hospital near the Ho Chi Minh trail.

“Dr. Phi Phi and her colleagues were forced to harvest and eat the roots of those plants that were edible, such as potato and manioc, not knowing that those roots, as well as the water from the streams that that they relied upon for sustenance, had become poisoned by the herbicides. During the entire

⁹³ “Agent Orange” Product Liability Litigation, Complaint. MDL No. 381, 04-CV-400, United States District Court Eastern District Of New York, VAVAO vs. Dow Chemicals, Monsanto et al, pg. 15.

⁹⁴ Stellman, JM, Stellman, SD, Christian RC, Weber, TW and Tomasallo, C. The extent and patterns of usage of Agent Orange and other herbicides in Vietnam. *Nature*, 422, 681-687, 2003 (cover article).

period she served as Director of Hospital No. 1, Dr. Phi Phi ate food and drank water exposed to the herbicides.”⁹⁵

Additionally, some plaintiffs claimed direct contact with the herbicides, like Duong Quynh Hoa, who “came across a container of herbicides...dropped by US aircraft.”⁹⁶

This exposure data was supplemented by three studies. One was an interpretation of Stellmann’s study, which noted that the herbicide usage in Vietnam was an order of magnitude greater than United States domestic usage, which speaks to emissions. The complaint also stated that the study “estimated that two to four million Vietnamese people were affected by herbicide exposure,”⁹⁷ which seems to be a reference to the Stellmann, et al conclusion that “among the hamlets with some population data...at least 2.1 but perhaps as many as 4.8 million people would have been present during the spraying”.⁹⁸ This conflated emissions with disease causation, as the evidence from the study clearly deals with total emissions data, but it is cited within the complaint as “affected by herbicide exposure” which is a causal claim.

The second study cited was a study of levels of TCDD within the Aluoi Valley, specifically the village of A So, located on the site of a former special forces base, published in *Chemosphere* in 2002. The paper primarily investigates the hypothesis that TCDD contamination could travel up the food chain, from “soil to fish pond sediment to

⁹⁵ “Agent Orange” Product Liability Litigation, Complaint. MDL No. 381, 04-CV-400, United States District Court Eastern District Of New York, VAVAO vs. Dow Chemicals, Monsanto et al, pg. 31.

⁹⁶ Ibid, 36.

⁹⁷ “Agent Orange” Product Liability Litigation, Complaint. MDL No. 381, 04-CV-400, United States District Court Eastern District Of New York, VAVAO vs. Dow Chemicals, Monsanto et al, pg. 49.

⁹⁸ Stellman, JM, Stellman, SD, Christian RC, Weber, TW and Tomasallo, C. The extent and patterns of usage of Agent Orange and other herbicides in Vietnam. *Nature*, 422, 681-687, 2003 (cover article). Pg. 685.

cultured fish and duck tissues”⁹⁹ This, unlike the previous study, addressed the mechanisms of contamination stated within the plaintiff’s stories, and clearly showed exposure data, via blood and human breast milk testing.

The last study, “Recent dioxin contamination from Agent Orange in residents of a southern Vietnam city” directly addressed the current contamination of Vietnam by testing the level of TCDD in the blood of 20 people living in Bien Hoa, a city near an airbase used for spray missions in South Vietnam. It, like the previous studies it cites, found that overall dioxin levels were declining, but that TCDD, the dioxin specific to Agent Orange and other pesticide contamination was elevated. The authors hypothesize that this is due to the exposure route cited in the Dwernychuk study.¹⁰⁰ Again, this study constructs evidence of continued exposure and theorizes on a potential avenue, but did not suggest any casual relationship between Agent Orange or dioxin contamination in general, and disease.

Association:

The only element of the causation of harm debate introduced within the complaint was the mention of a set of IOM committee reviews on herbicide exposure and disease among United States veterans. The purpose of the IOM reviews, as stated in both the IOM text and the complaint, is “to perform a comprehensive evaluation of scientific and medical information regarding the health effects of exposure to Agent Orange, other

⁹⁹ L. Wayne Dwernychuk, Hoang Dinh Cau, Christopher T. Hatfield, Thomas G. Boivin, Tran Manh Hung, Phung Tri Dung, Nguyen Dinh Thai, Dioxin reservoirs in southern Viet Nam--A legacy of Agent Orange, *Chemosphere*, 47:2, April 2002, Pages 117-137.

¹⁰⁰ Schechter, A; Dail LC; Papke O, Prange J, Constable JD, Matsuda M, Thao VD, Piskao AL. “Recent dioxin contamination from Agent Orange in residents of a southern Vietnam city.” *Journal of Occupation Environmental Medicine*. 2001 May; 43(5) 435-443.

herbicides used in Vietnam, and the various chemical components of those herbicides, including TCDD”¹⁰¹ The complaint also stated that the IOM review found an association between exposure to herbicide and a number of different diseases or medical outcomes, which is representative of the general nature of the report. The IOM review looks for evidence of association, not causation, and although the association is evaluated partially on the basis of biologic mechanisms, a mechanism is not required for a listed association.

Causation Analysis:

Before considering the specific plaintiffs cited in the complaint, it is vital to consider the general causation case that could be built on the information included in the complaint. General causation is, as mentioned in Part I, the first step towards a judicial decision involving specific individuals, and even more important, vital to the plaintiffs’ claim that the class involved in the suit was “themselves and all other Vietnamese nationals who were exposed to herbicides used in the war with the United States.” Thus, general causation becomes, under the weak preponderance rule, the only causation relevant to the toxic tort, in that proving an increase in risk for harm due to dioxin within the general context of the class would eliminate the need to prove causation for specific individuals.

The plaintiffs clearly outlined evidence of general emissions in the complaint and it is consistent with the most recently published studies at the time the complaint was filed. The evidence organized in the “Statement of Facts” and “Recent Studies” outlined a

¹⁰¹ Committee to Review the Health Effects in Vietnam Veterans of Exposure to Herbicides (Seventh Biennial Update), Institute of Medicine. *Veterans and Agent Orange: Update 2008*.

modern understanding of the spraying and conditions of use of dioxin contaminated herbicides in Vietnam.

General exposure is more tricky. The inclusion of the anecdotal stories of the specific plaintiffs and their dioxin exposure is questionable, as it is disassociated from the studies that are cited to illustrate that such exposure mechanisms are possible. In the Dr. Phi Phi example cited earlier, Phi Phi, under the studies cited further in the complaint, could have had higher dioxin levels than an unexposed Vietnamese citizen because of her consumption of high food chain fatty foods such as poultry and pork. However, the plaintiffs did not make the connection between the studies and the anecdotal data cited, and the plaintiffs' experiences are not noted as being representative of the class, as they were in the 1984 settlement case. Exposure evidence that would help to show general causation is also more difficult, as both studies cited were confined to small areas outside former military bases, where dioxin concentrations would naturally be higher. The Stellman study does make a statement about the widespread nature of exposure; however, it does not claim to be able to determine the severity of such exposure.¹⁰²

General causation of harm itself was not addressed in any meaningful form in the complaint. The complaint presents the specific causation cases as clear cause and effect, i.e., the plaintiff was exposed to dioxin via this method, the plaintiff had a health issue, the health issue was caused by dioxin exposure. The fact that the plaintiffs were exposed to herbicides that might or might not have contained dioxin does not represent evidence that their disease was linked to herbicide usage, as Weinstein points out in his dismissal:

¹⁰² Stellman, JM, Stellman, SD, Christian RC, Weber, TW and Tomasallo, C. The extent and patterns of usage of Agent Orange and other herbicides in Vietnam. *Nature*, 422, 681-687, 2003 (cover article). Pg. 686.

“The fact that diseases were experienced by some people *after* spraying does not suffice to prove general or specific causation, i.e., that the harm resulted to individuals *because* of the spraying. *Post hoc ergo propter hoc* remains a logical fallacy unacceptable in toxic tort law.”¹⁰³

Weinstein continues by stating that causal connections require epidemiological evidence and other scientific data, like that mentioned in Part I. No studies of the type Weinstein suggests had been completed on Vietnamese subjects at the time of the complaint, and therefore, no real general causal evidence is included in the complaint.

The only epidemiological work listed within the complaint is the IOM Veterans and Agent Orange updates. First, the IOM analyses, although inclusive of studies not involving the experience of veterans, are primarily aimed at producing data on the exposure of dioxin and herbicides on the Vietnam veterans. Very few studies involve a Vietnamese population with long term and diffuse level exposure, and very few studies analyze the food chain related method of exposure mentioned in the previous cited works.

The IOM analysis does not attempt to create a causal link between outcomes and herbicide exposure, as discussed earlier. The categories laid down by the IOM are “Sufficient Evidence of an Association, Limited or Suggestive Evidence of an Association, Inadequate or Insufficient Evidence to Determine Whether an association Exists” and “Limited or Suggestive Evidence of No Association.”¹⁰⁴ Although causal elements are considered, the purpose of the study is to inform a larger picture of veterans’ health as related to Agent Orange for the Veterans Affairs Department. The plaintiffs’ marshalling of the IOM analysis as data to support their larger general and specific claims

¹⁰³ “Agent Orange” Product Liability Litigation, Memorandum, Order and Judgment, MDL No. 381, 04-CV-400, United States District Court Eastern District Of New York, VAVAO vs. Dow Chemicals, Monsanto et al, pg. 42.

¹⁰⁴ IOM (Institute of Medicine.) 2002. *Veterans and Agent Orange: Update 2002*. Washington, DC: The National Academics Press.

also demonstrates unrealistic expectations about the way courts handle causation questions, as opposed to the VA and other similar organizations. As Judge Weinstein states in his dismissal,

“Those studies supporting Veterans Administration decisions to declare some diseases presumptively caused by Agent Orange as a basis for disability payments (extremely low probability required) are of almost no use in determining causation for litigation purposes (more probable than not shown by admissible proof required).”¹⁰⁵

Examples of this include diseases like Type II diabetes, which have been shown to have limited or suggestive evidence of association, but there is little to no evidence of a mechanism by which dioxin would contribute to the development of Type II diabetes, and as such, it has been viewed as a failure of the presumptive disability system—something that the VA covers for veterans but that would not stand up to a causation challenge in court.¹⁰⁶

Finally, the evidence that existed in 2002 about association did not even support the particular disease claims made in the complaint. The specific diseases and injuries listed are miscarriages, still birth, stomach cancer, liver damage, developmental disabilities in children of victims, diabetes, epilepsy, breast cancer, ovarian tumors, nose infections, lung cancer, spina bifida, intestinal tumors and non-function thyroid, congenital birth defects, chronic fatigue, osteosarcoma, Hodgkin’s Disease, lung cancer,

¹⁰⁵ “Agent Orange” Product Liability Litigation, Memorandum, Order and Judgment, MDL No. 381, 04-CV-400, United States District Court Eastern District Of New York, VAVAO vs. Dow Chemicals, Monsanto et al, pg. 24.

¹⁰⁶ IOM (Institute of Medicine.) *Improving the Presumptive Disability Decision-Making Process for Veterans*. Washington, DC: The National Academies Press. 2008.

and chloracne.¹⁰⁷ The 2002 IOM Update lists two of these conditions as “sufficient evidence of association”: Hodgkin’s disease and chloracne. Three more are “limited or suggestive evidence of an association”: respiratory cancer, type 2 diabetes, and spina bifida. All other claims on the list (13) either fall into the inadequate or insufficient evidence of association” or “suggested evidence of no association” categories.¹⁰⁸ Even if one overlooks the IOM emphasis on association and not causation, many of the claims made by the plaintiffs in the case do not match up to the data cited in the complaint.

The evidence laid out in this complaint does not even come close to creating grounds for general causation within the Vietnamese exposed population on the diseases mentioned in the individual sections, much less on the more general claim of “diseases, defects, ill health and other conditions suffered.” The emissions issue is well laid out, exposure is moderately effective, although could use more information, but the causation of harm case barely identifies associations, let alone allowing for causal claims.

¹⁰⁷ “Agent Orange” Product Liability Litigation, Complaint. MDL No. 381, 04-CV-400, United States District Court Eastern District Of New York, VAVAO vs. Dow Chemicals, Monsanto et al, pg. 30-47.

¹⁰⁸ Veterans and Agent Orange: Update 2002. (2002)

Tort Law in *VAVAO vs. Dow Chemical, Monsanto et al. (2004-2008)*:

Government Contract:

The government contract defense, the first issue that was to be addressed under Judge Pratt's serial trials in the 1980s, resurfaced in the 2004 case. This is a partial result of the many opt-out trials that occurred between 1984 and 2004, which had gone through full discovery, eliciting the precise nature of the relationship between the government and each of the chemical companies.

VAVAO vs. Dow Chemical, Monsanto et al. raised significantly different government contract issues than previous cases. Although domestic claims (assault and battery, etc) could be easily dismissed within the grounds of the government contract defense as laid out in previous cases,¹⁰⁹ the international war crimes claims were not addressed by any of the previous cases. Defendants argued that the international claims involving war crimes were also subject to government contract defense and thus similarly dismissed, but Judge Weinstein disagreed. The primary reference for government contract defense in international cases was the post-World War II Nuremberg trials, specifically the case involving the manufacture of Zyklon B (*Zyklon B Case (Trial of Bruno Tesch and Two Others)*)¹¹⁰.

In the *Zyklon B Case*, two heads of a manufacturing firm that provided the Third Reich with supplies of Zyklon B were held responsible for war crimes, and found guilty, despite the parity of knowledge between the government contractor and the government.

¹⁰⁹ Cases that occurred between 1984-2004 had done intensive discovery on the knowledge of the chemical companies at the time of Agent Orange production, and had determined that there was knowledge parity.

¹¹⁰ "Agent Orange" Product Liability Litigation, Memorandum, Order and Judgment, MDL No. 381, 04-CV-400, United States District Court Eastern District Of New York, *VAVAO vs. Dow Chemicals, Monsanto et al.*, pg. 142.

In this case, the Zyklon B manufacturers knew about the usage in concentration camps, as ascertained from a variety of evidence produced by their employees and their travel records.¹¹¹ In short, if a commercial transaction by civilians results in a violation of the laws and customs of wars, the civilian is not protected from being tried as a war criminal – and is not shielded under government immunity. The government contract defense was not a defense against war crimes, only against tort actions within one’s home country.¹¹²

Indeterminate Plaintiffs and Indeterminate Defendants:

Two of the fundamental tort issues salient in the 1984 case, the “indeterminate plaintiff” and the “indeterminate defendant,” reappear in the 2004 case. However, they both take vastly different forms.

The indeterminate plaintiff does not get mentioned in the brief at all, despite the clear applications to the case. Again, in a mass toxic tort suit, plaintiffs are necessarily indeterminate. The specific Vietnamese cited in the complaint mirror the representative plaintiffs of the first case, and specific causation, to the same extent, is addressed for them. However, versions of the preponderance rule are not addressed. This may be because the plaintiffs did not get that far in the lawsuit to lay out a method of actually proving their claims, or that they assumed Weinstein would take a similar attitude as in previous cases, like using the weak preponderance rule.

The indeterminate defendant exists in similar limbo. No method of enterprise, proportional, or any other type of liability is mentioned within the context of the lawsuit.

¹¹¹ The Zyklon B, Case Trila of Bruno Tesch and Two Others. British Military Court, Hamburg 1st-8th March 1946. As accessed via <http://www.ess.uwe.ac.uk/wcc/zyklonb.htm>

¹¹² “Agent Orange” Product Liability Litigation, Memorandum, Order and Judgment, MDL No. 381, 04-CV-400, United States District Court Eastern District Of New York, VAVAO vs. Dow Chemicals, Monsanto et al, pg. 148

In fact, this lawsuit is even more problematic in that regard than the first Agent Orange suit, as it holds more manufacturers liable in its extension to other herbicides besides Agent Orange. Presumably, since the government contractor defense is applied, Weinstein holds the VAVAO suit accountable to a similar system of liability. But still, as he puts it, “No study or technique presented to the court has demonstrated how it is now possible to connect the herbicides supplied by any defendant to exposure by any plaintiff to dioxin from that defendant’s herbicide.”¹¹³ The introduction of other herbicides raises larger questions about apportioning liability, given different chemical components that might cause harm, and broadens the pool of potential defendants to the point where proportional liability may no longer be possible.

Justiciability:

Justiciability is a core concept of the legal system. Courts are only able to adjudicate cases that do not infringe on the abilities of other branches of government, and as Weinstein says, “the Supreme Court repeatedly has cautioned against adjudicating claims that would interfere with the conduct of foreign relations and war powers.” In order to determine if a case is justiciable, there is a six-factor test stemming from the 1961 Supreme Court case *Baker v. Carr*. (Appendix 5) In the case of the 2004 case, none of the specific factors are present, but there is the clear potential for interference with existing government choices.

¹¹³ “Agent Orange” Product Liability Litigation, Memorandum, Order and Judgment, MDL No. 381, 04-CV-400, United States District Court Eastern District Of New York, VAVAO vs. Dow Chemicals, Monsanto et al, pg. 12.

Changes in Causation from 1984 to 2005:

General Trends:

Between the 1979 filing of the first Agent Orange case and the 2005 dismissal, the way causation was handled in the courtroom changed considerably. When Agent Orange first entered the courtroom, toxic torts were still a relatively new phenomenon. Questions of specific and general causation were still academic and Weinstein broke new ground with his thoughts on preponderance of evidence in the Fairness Opinion. As discussed earlier, previous toxic tort cases with successful recovery had diseases (“signature effects”) that were closely tied to the product in question, like asbestos and asbestosis.

The Agent Orange case of the 1980s broke new ground in mass claims, but the 2005 did not. Although many aspects of diseases related to Agent Orange are still in question, the process of proving causation is less nebulous. In fact, rules laid down by the Supreme Court in *Daubert vs. Dow Pharmaceuticals* seem to support the basic tactics that Weinstein took in the first case. *Daubert* and its companion cases modified the rules for admission of expert testimony by making judges responsible for admission of evidence based on reliability and “general scientific consensus.”¹¹⁴

Previous rules, under *Frye*, had tested for expert admissibility by asking whether the science or the techniques upon which the expert was testifying enjoyed at least “general acceptance” in the scientific community, if not backed by a full consensus. This meant that expert testimony based on a methodology that was accepted could be introduced as evidence, even if the expert’s testimony went against the larger scientific record. *Frye* was a more lenient standard than *Daubert*, which places the judge in the role

¹¹⁴ Cranor, Carl. *Toxic Torts: Science, Law and the Possibility of Justice*. Cambridge: Cambridge UP, 2006. 49.

of "gatekeeper", preventing fringe science from entering the courtroom. In effect, by forcing the settlement in the first case, Weinstein was playing "gatekeeper" about evidence in the courtroom, foreshadowing the role of judges in the 1990s.

Not By Epidemiology Alone: Evaluating Multiple Types of Evidence

In the early days of the Agent Orange cases, epidemiological evidence was considered the gold standard of general causation. There were good reasons for this—epidemiological evidence is designed to show that a given exposure or substance can cause a harm in a population. However, since 1984, causal theorists have asked more than epidemiological evidence. Between 1984 and 2005, dioxin was studied extensively. However, many other cases with toxic tort requirements have not produced the level and amount of analysis that dioxin or Bendectin (the drug involved in the *Daubert* case) has. In these cases, a demand for human epidemiological studies from courts can often hamper the process of a lawsuit. Epidemiology is fundamentally observational and prone to confounding and bias, and is often vastly more expensive than other methods of determining toxicity. Animal model testing, chemical structure analysis, and other forms of evidence can provide evidence that, while not eliminating the need for human testing, complement it.¹¹⁵

Carl Cranor, in his seminal text, *Toxic Torts: Science, Law and the Possibility of Justice*, cites Judge Weinstein's Fairness Opinion from 1985 as an example of what not to do.¹¹⁶ So, in a way, Tom Henderson, the lawyer whose causal evidence theory was so profoundly rebuffed in 1984, had the long-term advantage on Yannacone. Henderson had

¹¹⁵ Cranor, Carl. *Toxic Torts: Science, Law and the Possibility of Justice*. Cambridge: Cambridge UP, 2006. 49. 226.

¹¹⁶ *Ibid.* 224.

argued for an integrated approaching, including toxicity and animal testing, where as Yannacone had concentrated only on epidemiological data. Epidemiological evidence proved the plaintiffs' undoing in 1984, but the strategy involving a wider array of evidence methods was vindicated by 2005.

2.0 Standard for Relative Risk:

In his Fairness Opinion in 1984, Judge Weinstein makes the assertion that in tort law, due to the "more likely than not" standard, epidemiological evidence requires a "two-fold increase in incidence of the disease attributable to Agent Orange exposure."¹¹⁷

In this case, it becomes clear that Weinstein is talking about a 2.0 risk ratio, or as it is commonly referred to, relative risk, against background factors. Risk ratio is an epidemiological construct which divides the increase in risk in an exposed population by the risk in an unexposed population. A risk ratio of one represents no difference between an exposed and unexposed population.¹¹⁸ A 2.0 risk ratio has been a standard of courtroom evaluation of epidemiological evidence since the 1980s.¹¹⁹ Between 1984 and 2004, a number of epidemiological scholars and causal theorist tackled the relative risk question. Many disagreed with judges that it was a good way of measuring a causal relationship, and some argued that it did not represent a preponderance of evidence rule. A risk ratio above two does not follow to a more likely than not standard.¹²⁰ Relative risk

¹¹⁷ Weinstein, Jack. Fairness Opinion. "Agent Orange" Product Liability Litigation, MDL No. 381, 597 F. Supp. 740 (1984). United States District Court Eastern District Of New York. 784.

¹¹⁸ Rothman, Kenneth J. *Epidemiology: An Introduction*. Oxford, England: Oxford University Press. 2007. 48.

¹¹⁹ Cranor, Carl. *Toxic Torts: Science, Law and the Possibility of Justice*. Cambridge: Cambridge UP, 2006. 233.

¹²⁰ Greenland, Sander and Robins, James. "Epidemiology, Justice and the Probability of Causation." 40 *Jurimetrics* 321-340 (2000).

“does *not* denote the product of the probability that harm will occur and the gravity of that harm; in fact it does not even denote a probability, strictly speaking without ancillary assumptions about the nature of probability.”¹²¹ In short, risk ratios or relative risk based on a hard lower boundary (like 2.0) do a disservice to epidemiological evidence presented in support of scientific causation in courtrooms- and it is worth noting that they are not mentioned in Judge Weinstein’s evaluation of the evidence in the dismissal 2005.

The Special Case of Agent Orange: Association vs. Causation

In VAVAO vs. Dow Chemical, Monsanto et al. the Institute of Medicine analysis relied on by the plaintiffs assesses the strength of evidence of association between exposure to military herbicides and disease, not the strength of evidence for causation. This seems unique to Agent Orange. The IOM studies and updates, the most definitive source on research on dioxin, take causal evidence into account. The updates include biologic mechanisms, often the jumping off point for a transition from an association to a causal claim, but the categories established by the committee are measures of association. This is a product of the original mandate from Congress, which required the committee to determine whether there was a “statistical association between the suspect diseases and herbicide use.”¹²²

It is also a product of the difficulty of determining exposure from the existing data, as in many cases, it precludes quantification of any increase in risk.¹²³ Many studies of dioxin exposure from Agent Orange are limited by the same data problems that the

¹²¹ Broadbent, Alex. “Epidemiological Evidence in Proof of Specific Causation.” Publication forthcoming.

¹²² IOM (Institute of Medicine.) *Veterans and Agent Orange: Health Effects of Herbicides Used in Vietnam*. Washington, DC: The National Academics Press. 1991. 5.

¹²³ IOM (Institute of Medicine.) *Veterans and Agent Orange: Update 2005*. Washington, DC: The National Academics Press. 2005. 446.

IOM study is and are able to show emissions and association, but not calculate exposure accurately, thus making causal claims difficult.

**Tort Law Over Time:
Indeterminate Plaintiff:**

Clear changes have occurred to the process of determining how to deal with questions of the indeterminate plaintiff. Judge Weinstein was one of the first judges to adopt the weak preponderance of evidence test in order to allow mass toxic tort plaintiffs to use general causation evidence to provide for specific causation throughout the class. This evidence standard has spread to become the norm in many toxic tort cases, given its balance between traditional tort remedies, transactional costs, and ability for plaintiffs to successfully prove their case.¹²⁴ The benefits of the weak preponderance rule include not undercompensating, and not underdetering. Undercompensating occurs when a plaintiff is not compensated for real harms because of the requirement of specific evidence, whereas underdeterance is the eventual outcome on the system, in that companies that are not held accountable will not be deterred from producing potentially harmful products.¹²⁵ Although the evidence in 2005 had not progressed to the point where a case could be made based on a full understanding of causation and then applied to individuals, it seems likely that the weak preponderance rule could have been used profitably.

Many scholars within the legal community have criticized the weak preponderance rule. Although it does not undercompensate or underdeter to the extent that the strong rule might, the weak rule allows a court to rely solely on statistics to

¹²⁴ Madden, Stuart M. *Exploring Tort Law* Cambridge: Cambridge UP, 2005. 396

¹²⁵ Brinker, Shelly "Opening the Door to the Indeterminate Plaintiff: An Analysis of the Causation Barriers Facing Environmental Toxic Tort Plaintiffs." 46 *UCLA L. Rev.* 1289. 2003. 1311.

determine recovery. Critics argue that statistics are based on assumptions about population data, which cannot be wholly accurate; therefore, cases that rely on statistics for causation do not express the full picture.¹²⁶

Indeterminate Defendant:

Weinstein’s method of handling the indeterminate defendant in the context of the settlement was certainly effective, and has been passed down as an equitable way to handle a complex set of requirements. Like the problem of the indeterminate plaintiff, years of toxic tort suits have settled some of the questions Weinstein raised about enterprise or proportional liability, and methods of determining defendant responsibility have taken a back seat to causal concerns.

Government Contract Defense:

The government contract defense with regards to the Agent Orange cases has remained a significant issue in all cases after the 1985 settlement. *Isaacson v. Dow Chem. Co.* found that the government contractor defense did indeed apply to Agent Orange, albeit 20 years after Judge Pratt abandoned his serial trial theory.¹²⁷ Since 1985, the government contract defense has expanded to include military service contractors, and non—military contractors, since “a contractor who is compelled by a contract to perform an obligation for the United States, should, in some circumstances, share the sovereign immunity of the United States.”¹²⁸ The expansion of the government contractor defense

¹²⁶ Brinker, Shelly “Opening the Door to the Indeterminate Plaintiff: An Analysis of the Causation Barriers Facing Environmental Toxic Tort Plaintiffs.” 46 UCLA L. Rev. 1289. 2003.1312.

¹²⁷ *Isaacson v. Dow Chem. Co.*, 304 F. Supp. 2d 404 (E.D.N.Y. 2004)

¹²⁸ *Carley v. Wheeled Coach*, 991 F.2d 1117, 1128 (3d Cir. 1993)

represents an interesting development, which might be relevant in future cases like Agent Orange.

However, this expansion still does not cover international war crimes, as argued by Judge Weinstein in the dismissal of the 2005 case. The applications of the government contract defense in international law created interesting questions, in that many of the statutes that were thrown out as not being relevant or applicable to the defendants might not have fallen under the same set of corporate accountability laws, and thus, might have provoked an actual test of government contract defense against international law.

Conclusion:

Between 1985 and 2005, mass toxic torts went mainstream. In the 1985 settlement, only DES and asbestos had explored causation issues like those raised by Agent Orange, and both of those substances had signature effects and specific populations. *In re Agent Orange Product Liability Litigation* was the first case of its kind to hinge on questions of indeterminate plaintiffs and defendants, and where a causation case was crucial to the end outcome yet unavailable. The settlement, brought on by the extraordinary efforts of an activist judge, was a net win for both sides: the plaintiffs did not have see their case dismissed because of choice of law or failure to prove causation; the defendants did not have to watch the impending public relations explosion of being accused of poisoning America's veterans. Yet, the settlement pushed back some of the crucial causal questions that came to be the hallmark of later Agent Orange litigation at the same time that it allowed Judge Jack Weinstein to weigh in on how he felt the case should be handled.

In the 2004 VAVAO suit, the same questions reappeared, but with even larger stakes. Now the fate of entire country and entire set of political decisions could be put on trial. This case, not settled but dismissed, still meant that Agent Orange causation and the tort problems associated with it still never got their day in court. The failure of the plaintiffs to provide statutes under which the defendants could be held liable as well as to provide claims where relief was actually a viable option meant that we've still never seen an airing of these causal issues in front of a jury. However, 2004 represented substantial progress over the 1985 questions of how to show causation and handle complex torts. Judges were now expected to take on a gatekeeping role, keeping questionable science

out of the courtroom, and the weak preponderance rule had gained a wide acceptance.

Weinstein's views on torts had been vindicated, even if some of the claims he made about how to show causation had been shown to be faulty.

Although the case against Agent Orange manufacturers in 2005 was still questionable, especially with regards to the variety of diseases claimed by the VAVAO plaintiffs, it is no longer in question that dioxin is toxic and can cause harm. What remains, and perhaps Judge Weinstein will figure it out in another Agent Orange case, is how to show who was harmed, and how similar future incidents can be prevented.

Appendices

Appendix 1: CDC Birth Defects Study EOI

Examples of Agent Orange Exposure Opportunity Index Scores

Index Score = 1 (minimum opportunities for exposure)

1. Service in selected locations at specific times (any job description except handling Agent Orange), e.g., Cam Ranh Bay (1966), Qui Nhon (1968-1969), Nha Trang (1967-1968)
2. Non-Ranch Hand pilots and aircrew (1966-1967)
3. Specified controlled environments, e.g., battalion surgeon (1968)

Index Score = 2

1. Service in selected locations at specific times, e.g., Gia Le (1969-1970), Phan Rang (other than September-December 1968, March-September 1970), Qui Nhon (1968-1969)
2. Selected noninfantry occupations at specified places and times, e.g., company clerk—Duc Pho (1968-1969), radio repairman—Chu Lai (1966-1967), truck driver—Cu Lam Nam (1968)
3. Noninfantry stationed at selected bases with perimeter spraying, e.g., wireman—Chu Lai (1968-1969)

Index Score = 3

1. Service at bases with perimeter spray operations, specified times, e.g., Chu Lai (1968-1969), Camp Eagle (1968-1969), LZ English (1967-1968)
2. Selected noninfantry occupations at specified locations and times, e.g., salvage specialist—Danang (1969-1970), M.P.—Danang (1968-1969), wheeled vehicle mechanic—Long Binh (1966-1967)

Index Score = 4

1. Infantry/combat arms at specified locations and times, e.g., An Khe (1966-1967), Tam Ky (1967-1968), Tay Ninh (1969-1970)
2. Selected noninfantry at specified locations and times, e.g., Helicopter pilot—Cu Chi (1966-1967), M.P.—Long Binh (1967-1968)
3. Advisors of Army, Republic of Vietnam Divisions (1968-1969)
4. Special Forces Camps (field personnel), e.g., Nha Trang (1969-1970)

Index Score = 5 (most numerous opportunities for exposure)

1. Infantry/combat arms at specified locations and times, e.g., A Shau Valley (1969), Tay Ninh (1968), Phuoc Vinh (1967)
 2. Service at specified locations and times with aborted Ranch Hand missions or other herbicide mishaps, e.g., Bien Hoa AFB (July 1967, November 1968), Long Binh Post (1967-1969), Phu Cat AFB (1969-70)
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Appendix 2: *Prima Facie* Product Liability Qualifiers

From Weinstein, Jack. Fairness Opinion. “Agent Orange” Product Liability Litigation, MDL No. 381, 597 F. Supp. 740 (1984). United States District Court Eastern District Of New York. 833.

- (1) plaintiff was injured
- (2) the injury was caused by Agent Orange
- (3) a defendant had violated some legal duty owed to the plaintiff (as by negligent manufacture of Agent Orange),
- (4) the particular Agent Orange causing injury to the plaintiff was manufactured by that defendant.

Appendix 3: AOC Complaint List of Legal Violations

From “Agent Orange” Product Liability Litigation, Complaint. MDL No. 381, 04-CV-400, United States District Court Eastern District Of New York, VAVAO vs. Dow Chemicals, Monsanto et al, pg. 51.

List of Laws Plaintiffs Claim Defendants Violated:

- a. Alien Tort Claims Act, 28 U.S.C. §1350;
- b. Torture Victim Protection Act, 28 U.S.C. § 1350;
- c. War Crimes Act, 18 U.S.C. § 2441;
- d. 1925 Geneva Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare;
- e. Article 23 of the Annex to the Hague Convention IV, Respecting the Laws and Customs of War on Land, signed 18 October 1907
- f. Geneva Convention relative to Protection of Civilian Persons in Time of War, signed at Geneva 12 August 1949;
- g. Agreement for the Prosecution and Punishment of the Major War Criminals of the European Axis and Charter of the International Military Tribunal at Nuremberg, signed and entered into force August 8, 1945;53
- h. United Nations Charter, signed at San Francisco on June 26, 1945 and entered into force on October 24, 1945;
- i. United Nations General Assembly Resolution No. 2603-A (1969);
- j. Customary international law;
- k. Common law of the United States of America;
- l. The laws of Vietnam;
- m. Common law of the State of New York, including but not limited to products liability, assault and battery, negligence, recklessness, intentional infliction of emotional distress, negligent infliction of emotional distress, civil conspiracy, unjust enrichment, and public nuisance.

Appendix 4: Claims for Relief Filed by VAVAO Plaintiffs

From “Agent Orange” Product Liability Litigation, Complaint. MDL No. 381, 04-CV-400, United States District Court Eastern District Of New York, VAVAO vs. Dow Chemicals, Monsanto et al, pg. 66.

Claims for Relief Filed by VAVAO Plaintiffs:

- a. War Crimes
- b. Genocide
- c. Crimes Against Humanity
- d. Torture
- e. Assault and Battery
- f. Intentional Infliction of Emotional Distress
- g. Negligent Infliction of Emotional Distress
- h. Negligence
- i. Wrongful Death
- j. Strict Products Liability
- k. Public Nuisance
- l. Unjust Enrichment
- m. Injunctive and Declaratory Relief

Appendix 5: Baker-Carr Test Factors

From *Baker v. Carr*, 369 U.S. 186 (1962).

Baker Carr Test:

1. [A] textually demonstrable constitutional commitment of the issue to a coordinate political department; or
2. a lack of judicially discoverable and manageable standards for resolving it;
3. or the impossibility of deciding without an initial policy determination of a kind clearly for nonjudicial discretion; or
4. the impossibility of a court’s undertaking independent resolution without expressing lack of the respect due coordinate branches of government; or
5. an unusual need for unquestioning adherence to a political decision already made; or
6. the potentiality of embarrassment from multifarious pronouncements by various departments on one question.

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