

## Chapter 3

### Rethinking the Lessons of Tokyo

*Amy E. Smithson*

Aum Shinrikyo's attack against the hapless commuters of Tokyo's subway on 20 March 1995 was viewed by many as a seminal event. While it is not surprising that the actions of this Japanese religious cult have been the subject of much discussion, those doing the talking have come to disparate conclusions as to just what Aum Shinrikyo's activities prove or disprove regarding chemical and biological terrorism.<sup>1</sup> Among the polar opinions are:

- \* "I think we're very fortunate in this country. We haven't had the kind of attacks they had in Tokyo. And I think it's just a question of time before someone attempts that sort of thing."—Senator Sam Nunn (D–Georgia, ret.)<sup>2</sup>
- \* "Terrorists may now feel less constrained to use a [biological, chemical, radiological, or nuclear] device . . . especially following the precedent-setting attack in 1995 by Aum Shinrikyo."—The Advisory Panel to Assess Domestic Response Capabilities for Terrorism Involving Weapons of Mass Destruction<sup>3</sup>
- \* "Proliferation of weapons of mass destruction does not mean that most terrorists are likely to use them in the foreseeable future, but some almost certainly will."—terrorist expert Walter Laqueur<sup>4</sup>
- \* "No one in the near future is going to see cities destroyed where tens of thousands die. Conventional explosives, like those used to create the Nairobi or Oklahoma City atrocities, will continue to inflict

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<sup>1</sup> "Some observers believe that the Aum is an aberration and that its Tokyo attack was an isolated incident unlikely to be repeated. But others believe that the incident illustrates a fundamental change in the proliferation threat: the ease with which such groups can acquire and deploy [weapons of mass destruction] capabilities undetected." John F. Sopko, "The Changing Proliferation Threat," *Foreign Policy* 105 (December 1996): 12.

<sup>2</sup> Prepared statement before the Senate Committee on the Judiciary, 104<sup>th</sup> Cong., 1<sup>st</sup> sess., 11 May 1995.

<sup>3</sup> *First Annual Report to the President and the Congress of the Advisory Panel to Assess Domestic Response Capabilities for Terrorism Involving Weapons of Mass Destruction: I. Assessing the Threat* (Washington, DC: 15 December 1999), vii. Hereafter referred to as the 1999 Gilmore panel report, so called for its chairman, Virginia Governor James Gilmore.

<sup>4</sup> Walter Laqueur, "Postmodern Terrorism," *Foreign Affairs* 75, no. 5 (September/October 1996): 34. More recently, Laqueur observed: "The ready availability of weapons of mass destruction has now come to pass, and much of what has been thought about terrorism, including some of our most basic assumptions, must be reconsidered. The character of terrorism is changing, any restraints that existed are disappearing, and, above all, the threat to human life has become infinitely greater than it was in the past." Walter Laqueur, *The New Terrorism: Fanaticism and the Arms of Mass Destruction* (Oxford: Oxford Univ. Press, 1999), 7.

the overwhelming bulk of the casualties. The plain fact is neither chemical nor biological weapons presently are truly weapons of mass destruction in the way atomic weapons are; and they are certainly not so in the hands of terrorists.”—Professor David C. Rapoport<sup>5</sup>

- \* “[T]he principal lesson that many take from Aum—that it opens up a new era of massively destructive [chemical and biological] attack—is both unfounded and unwise. Constraints may be eroding, but they have not gone away. Contrary to what some assert, it is not just a matter of time before we witness an attempt at mass murder using chemical or biological weapons.”—terrorist expert Brian Jenkins<sup>6</sup>

With this spectrum of opinion, many may wonder what lessons should be drawn from the Aum affair. Spurred by the Aum attack, the US government first tiptoed, then careened into an astounding number of terrorist preparedness programs, described in chapter 4. The amount of taxpayer dollars being spent makes it expedient to reexamine closely what transpired in Tokyo for the purposes of assessing whether those conceiving and implementing these programs gleaned appropriate or just convenient lessons from the Aum saga and the manner in which Japanese emergency crews responded to the public health and safety crises that the sect created.

## BEHIND THE FACADE OF AUM

Before the subway attack, Aum Shinrikyo registered with most Japanese citizens as an oddity or perhaps a nuisance, but few perceived them as a menace to society. A people of religious tolerance, the Japanese were accustomed to sects espousing various paths to enlightenment and salvation. The sect’s businesses—herbal teas and medications, noodle shops, health clubs, a babysitting service, and various computer-related enterprises—were also within the mainstream. The only ones who knew something ominous was afoot were the roiled citizens who lived near the cult’s compounds, the families who feared for loved ones who had inexplicably disappeared into the cult’s netherworld, and, belatedly, Japanese law enforcement authorities who slowly began to connect Aum Shinrikyo to such crimes as kidnaping and murder.

Aum Shinrikyo was the brainchild of Chizuo Matsumoto, a sight-impaired schoolyard bully whose childhood dreams were to attend Tokyo University and become the prime minister. His grand plans went

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<sup>5</sup> David C. Rapoport, “Terrorism and Weapons of the Apocalypse,” *National Security Studies Quarterly* V, no. 3 (Summer 1999): 49.

<sup>6</sup> Jenkins notes that after other high profile incidents (e.g., airline hijackings), other terrorist groups quickly began to duplicate those tactics. Aum’s attack was not duplicated, so, in Jenkins’ view, it stands to reason that the next fad in terrorism will not involve chemical and biological agents. Brian M. Jenkins, “Understanding the Link Between Motives and Methods” in *Terrorism with Chemical and Biological Weapons: Calibrating Risks and Responses*, ed. Brad Roberts (Arlington, Va.: The Chemical and Biological Arms Control Institute, 1997), 49, 51.

awry early though, because he apparently failed the college entrance exam and had to content himself with work as a masseuse. About this time, he became an avid student of Buddhist writings, joining a religious group that practiced Tantric Buddhism and selling fake medicines. In 1982, he was arrested, convicted, fined, and jailed for selling unregulated medicines, which would pale in comparison to his other activities once he matured as a charlatan. In 1984, Matsumoto started a small publishing house and his own yoga school, which he gradually reshaped into a cult. Matsumoto renamed himself Shoko Asahara, or “Bright Light,” and to attract followers, fostered the idea that he had supernatural capabilities such as the ability to levitate. During 1986 and 1987, he traveled to India, ostensibly absorbing the teachings of various religions and being blessed during the second trip by the Dalai Lama. Matsumoto used a photograph of this encounter as a marketing tool to heighten his Buddhist stature. At the same time, he showed no hesitation about calling upon whatever religions he felt would aid his cause, liberally borrowing from Hindu and Zen philosophies, as well. At one point, Matsumoto said he would “walk the same path as Buddha,” at another he claimed to be the Christian Messiah.<sup>7</sup>

Asahara’s hardcore recruits endured great hardships, taking chastity vows, cutting ties with their pasts, and forfeiting all assets to the cult to live in spartan conditions. Devotees were subjected to endless bombardment of the master’s wisdom and often deprived of food and sleep. Members paid to rent odd, battery-driven electronic caps that delivered six-volt shocks ostensibly to connect the wearer with Asahara’s brainwaves. The faithful paid for all manner of potions and notions to achieve elevated levels of enlightenment, ordination, and entry into Asahara’s inner circle, including \$1,000 for the honor of drinking their leader’s bath water and \$10,000 for a small vial of Asahara’s blood, also to be drunk. Those who balked at any aspect of the regimen were driven harder, drugged, and confined. In several instances, the cult resorted to murder to prevent defections.<sup>8</sup> Despite this concentration camp-like environment, Asahara’s faithful soon numbered in the tens of thousands, and its coffers are thought to have contained somewhere between \$300 million to \$1 billion. Tax breaks given to religious organizations abetted the cult’s financial

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<sup>7</sup> Some of Matsumoto’s grandiose claims can be found in his books, which include *The Secret Method for Developing Supernatural Powers* (1986), *The Day of Destruction* (1989), *From Destruction to Emptiness* (1989), and *Declaring Myself the Christ, Part I and Part II* (1992). The cult’s views about biological weapons are given in Asahara’s latter work, *Disaster Is Approaching in the Country of the Rising Sun* (1995). More details about Matsumoto’s early years and how the cult began can be found in D.W. Brackett, *Holy Terror: Armageddon in Tokyo* (New York: Weatherhill, 1996), 59–78, 95; David E. Kaplan and Andrew Marshall, *The Cult at the End of the World* (New York: Crown Publishers, Inc., 1996), 7–133. More briefly, the tale is told in Murray Sayle, “Nerve Gas and the Four Noble Truths,” *New Yorker*, 1 April 1996, 58–9; David E. Kaplan, “Aum Shinrikyo (1995),” in *Toxic Terror: Assessing the Terrorist Use of Chemical and Biological Weapons*, ed. Jonathan B. Tucker (Boston, Mass.: MIT Press, 2000), 286–8.

<sup>8</sup> Brackett, *Holy Terror*, 15–7, 72–4, 86–7, 97–8, 121–4; 144–50; Kaplan and Marshall, *The Cult at the End of the World*, 36–7, 60–3, 78–9, 81–3, 113–8, 175–81, 182–5, 226–7, 257–8; Sayle, “Nerve Gas and the Four Noble Truths,” 60–1, 64. On the cult’s liberal use of drugs, seventeen hundred members were apparently given the hallucinogenic LSD and more than one thousand others a mixture of LSD and amphetamines. Other drugs used for mind control included thiopental, mescaline, and methamphetamine. Anthony T. Tu, “Aum Shinrikyo’s Chemical and Biological Weapons,” *Archives of Toxicology, Kinetics and Xenobiotic Metabolism* 7, no. 3 (Autumn 1999): 48.

circumstances, as did the fact that the labor for its various enterprises was volunteer.<sup>9</sup> Before long, Aum Shinrikyo's tentacles reached overseas. In Russia alone, the cult had several branches in Moscow and eleven outside the capital city. Not coincidentally, several of these outposts were collocated with important missile, chemical, and biological weapons facilities. One of Asahara's greatest preoccupations was the acquisition of weapons capabilities, and he actively sought materials and knowledge from the experts that powered the former Soviet weapons programs.<sup>10</sup>

Asahara's deliberate and extensive pursuit of an unconventional weapons capability came on the heels of an embarrassing failure to expand the cult's power and influence through a more acceptable route. In February 1990, Aum Shinrikyo offered the Japanese electorate a slate of twenty-five candidates, including the guru himself, on the parliamentary ballot. The electoral defeat of the cult's Truth Party was total and humiliating. Voters rejected Aum's candidates in part because of the doomsday tone of Asahara's stump speeches. Disgraced and angered by having received only 1,783 votes for the entire lot of Aum candidates, Asahara began predicting two months later that a disaster would befall Japan. Buttressed by Shiva, the multi-armed Hindu goddess of destruction and rebirth that was the cult's chief deity, Asahara veered down a path to subvert the Japanese government and usurp power. Stirring in apocalyptic theories from other sources, Asahara's vision drew upon the biblical concept of Armageddon, the Buddhist notion of anarchy following the abandonment of Buddha's wisdom, and the end-of-the-world revelations of Nostradamus. He ordered the cult to arm itself for a cataclysmic battle, after which he assured his followers that they would be the super race.<sup>11</sup> Asahara and a few chosen disciples also began to make accusations that the cult was being attacked with poison gas and, conversely, publicly touting the virtues of sarin and Ebola.<sup>12</sup>

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<sup>9</sup> The lower estimate of the cult's wealth can be found in Kevin Sullivan, "Japan Cult Survives While Guru is Jailed: Group Worships Leader on Trial in Gas Attack," *Washington Post*, 28 September 1997. The higher figure is cited in Senate Staff Statement, US Congress, Senate Committee on Governmental Affairs, Permanent Subcommittee on Investigations, *Global Proliferation of Weapons of Mass Destruction*, 31 October and 1 November 1995 (Washington, DC: US Government Printing Office, 1996), 48, 57. Ever with an eye on how to make money, Asahara charged cult members a reported \$10,000 per month to rent these brain wave helmets. Sayle, "Nerve Gas and the Four Noble Truths," 59–69. On the protections of Japan's Religious Corporation Law, Brackett, *Holy Terror*, 52, 176–9.

<sup>10</sup> At its zenith, the size of the cult was estimated at forty to sixty thousand, with members in six countries. Testimony of John F. Sopko, Deputy Chief Counsel to the Minority, accompanied by Alan Edelman, Counsel to the Minority, US Congress, Senate Committee on Governmental Affairs, Permanent Subcommittee on Investigations, *Global Proliferation of Weapons of Mass Destruction*, 104<sup>th</sup> Cong., 1<sup>st</sup> sess., 31 October and 1 November 1995 (Washington, DC: US Government Printing Office, 1996), 16, 26; Kaplan and Marshall, *The Cult at the End of the World*, 213–4, 289; Brackett, *Holy Terror*, 91–2.

<sup>11</sup> Kaplan and Marshall, *The Cult at the End of the World*, 15–7, 46–9, 84–5, 222–3, 270; Brackett, *Holy Terror*, 81–4, 95–6, 105; Sayle, "Nerve Gas and the Four Noble Truths," 62–3; Tu, "Aum Shinrikyo's Chemical and Biological Weapons," 46, 49.

<sup>12</sup> In a 1994 speech in Moscow, one senior Asahara aide spoke of Ebola's utility as a weapon of war. The cult also made a video in 1994 called "Slaughtered Lambs" that it claimed documented poison gas attacks by Japanese and American aircraft against cult compounds. Brackett, *Holy Terror*, 102, 105–6. Also, Sayle, "Nerve gas and the Four Noble Truths," 68.

At Asahara's behest, a premium was placed on recruiting scientists and technicians to aid the cult's armament programs, which were impressive in their scope, if not always in their execution. The Clear Stream Temple housed the sect's high-technology weapons division, located some twenty miles from Mount Fuji at Aum's Kamikuishiki headquarters. In 1993, the cult opened a huge factory there with metal working machines, lathes, and other equipment suitable for fashioning weapons or the machinery needed to make weapons. Aum spent liberally, buying a \$400,000 green-light laser, a \$500,000 lens grinder, and computers and parts that cost millions.<sup>13</sup> The cult set its sights on futuristic armaments, like lasers and seismological weapons, but it also sought to harness one of the oldest weapons of all, disease.

### AUM'S TECHNICALLY INEPT BIOLOGICAL WEAPONS PROGRAM

While the cult's chemical weapons capability made worldwide news in the immediate aftermath of the Tokyo subway attack, Aum's quest for a biological weapons capability actually predated its chemical program. Seichi Endo, a graduate-trained molecular biologist with a background in genetic engineering, led an Aum party to the island of Hokkaido in March 1990 to obtain a seed culture of *Clostridium botulinum*.<sup>14</sup> Endo and Hideo Murai, a graduate-level physicist, were in charge of the sect's biological team, which numbered about ten.<sup>15</sup> Under their direction and the pretense of manufacturing herbal teas and medicines, the cult's front companies procured the equipment and other materials needed for a biowarfare program. The cult bought laboratory equipment in bulk quantities, freeze dryers, incubators, liquid nitrogen containers, grinders, fermenters, and appreciable amounts of growth media. Endo also saw to it that the cult's scientific library held the appropriate volumes and articles on how to produce various biological agents.<sup>16</sup>

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<sup>13</sup> Kaplan and Marshall, *The Cult at the End of the World*, 87–8, 102, 213–4, 216.

<sup>14</sup> Sheryl WuDunn, Judith Miller, and William J. Broad, "Sowing Death: How Japan Germ Terror Alerted the World," *New York Times*, 26 May 1998.

<sup>15</sup> The Japanese newspaper *Chunichi Shinbun* reported on 25 April 1995 that roughly eight people were helping Endo cultivate pathogens. According to another source, about a dozen people worked in Aum's biological program. See Milton Leitenberg, "Aum Shinrikyo's Efforts to Produce Biological Weapons: A Case Study in the Serial Propagation of Misinformation," in *Terrorism and Political Violence* 11, no. 4 (1999): 156, fn. 24. Endo, who was the cult's busy young Minister of Health and Welfare, studied molecular biology and genetic engineering from a research post at the Viral Research Center at Kyoto University. English sources often accredit Endo with having a PhD in molecular biology, but according to a 27 April 1995 report in the Japanese newspaper *Mainichi Shinbun*, Endo did not complete the requirements for this degree. Clarification of this matter and of the *Chunichi Shinbun*'s report on the size of Aum's biological warfare program provided in a personal communication with the author from Mr. Maasaki Sugishima of the Asahi University School of Law (4 September 2000). Murai, who held the title of Minister of Science and Technology, took graduate-level courses in astrophysics at Osaka University. Before joining Aum, he worked in the research and development department of Kobe Steel, Ltd. See also, Staff Statement, *Global Proliferation of Weapons of Mass Destruction*, 63; Kaplan and Marshall, *Cult at the End of the World*, 51–3, Kaplan, "Aum Shinrikyo (1995)," 293; Sopko, "The Changing Proliferation Threat," 13–4.

<sup>16</sup> Staff Statement, *Global Proliferation of Weapons of Mass Destruction*, 63; Kaplan and Marshall, *Cult at the End of the World*, 51–3, Kaplan, "Aum Shinrikyo (1995)," 293; Sopko, "The Changing Proliferation Threat," 13–4. Perhaps the earliest public description of the cult's laboratory equipment appeared in the 15 April 1995 edition of the *Yomiuri Shinbun*. Personal communication from Mr. Maasaki Sugishima (4 September 2000).

The cult's compound at Kamikuishiki was home to one of several Aum facilities involved in biological weapons research and production. The Kamikuishiki laboratory had all of the microscopes and glassware that one might expect. As shown in figure 3.1, collocated with the laboratory were fermentation and concentration tanks, along with a capability to heat dry liquid agent into solid cakes and subsequently grind it into powder form. Another biological laboratory was located at Aum's Mount Aso camp, in central Kyushu.<sup>17</sup> Those working in Aum's biowarfare facilities observed some biosafety practices, for some work was performed in clean rooms.<sup>18</sup> At a more advanced production facility that the cult was building in a four-story structure at their Naganohara compound, high-efficiency particulate air filters and containment features had been installed, along with electron microscopes, and advanced incubators. Murai planned to produce large amounts of botulinum toxin at this facility, which never opened. The scale of Murai's plans was revealed by the two hundred barrels of the growth medium peptone discovered stashed at the Mount Fuji compound. A class of university science students would consume about one liter of peptone a year for its research, but these drums contained about eighteen liters of peptone apiece.<sup>19</sup>

After their trip to Hokkaido, Aum scouted several biological agents. The cult sought information on the toxin of the green mamba snake, worked with poisonous mushroom spores, and was attempting to fabricate horse sera to make botulinum toxin. According to erroneous reports, the cult was also conducting research with Q fever, an agent that Asahara claimed had been sprayed on hundreds of his followers. Aum reportedly brought a Q fever culture back from a ranch the cult had purchased in Australia. The sect had a chicken egg production capacity in waiting to enable the growth of this microbe. Asahara himself led a forty-member cult medical team to Zaire in 1992, a trip billed as an "African Salvation Tour" to aid the victims of an Ebola outbreak. Reports circulated that the real purpose of the mission was to secure a seed culture

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<sup>17</sup> The Kamikuishiki facility also had freeze dryers. Kaplan and Marshall, *The Cult at the End of the World*, 51–2; Kyle B. Olson, "Overview: Recent Incident and Responder Implications," in *Proceedings of the Seminar of Responding to the Consequences of Chemical and Biological Terrorism*, Office of Emergency Preparedness (Washington, DC: US Public Health Service, Department of Health and Human Services, 11–14 July 1995), page 2-42.

<sup>18</sup> Testimony of Alan Edelman, US Congress, Senate Committee on Governmental Affairs, Permanent Subcommittee on Investigations, *Global Proliferation of Weapons of Mass Destruction*, 31 October and 1 November 1995 (Washington, DC: US Government Printing Office, 1996), 33; Kaplan and Marshall, *The Cult at the End of the World*, 51–2.

<sup>19</sup> According to the 28 March 1995 edition of the *Asahi Shinbun* and the April 3<sup>rd</sup> and 4<sup>th</sup> editions of the *Yomiuri Shinbun*, police seized two hundred barrels of peptone at Kamikuishiki and additional peptone at the Mount Aso facility. Also, prosecutor's statement, 25 April 1996 documents of Asahara's trial in Tokyo District Court, translation provided by Mr. Maasaki Sugishima (1 September 2000). Other sources give the figure of 160 barrels of peptone, WuDunn, Miller, and Broad, "Sowing Death"; Staff Statement, *Global Proliferation of Weapons of Mass Destruction*, 63, 151; Kaplan, "Aum Shinrikyo (1995)," 293–4.

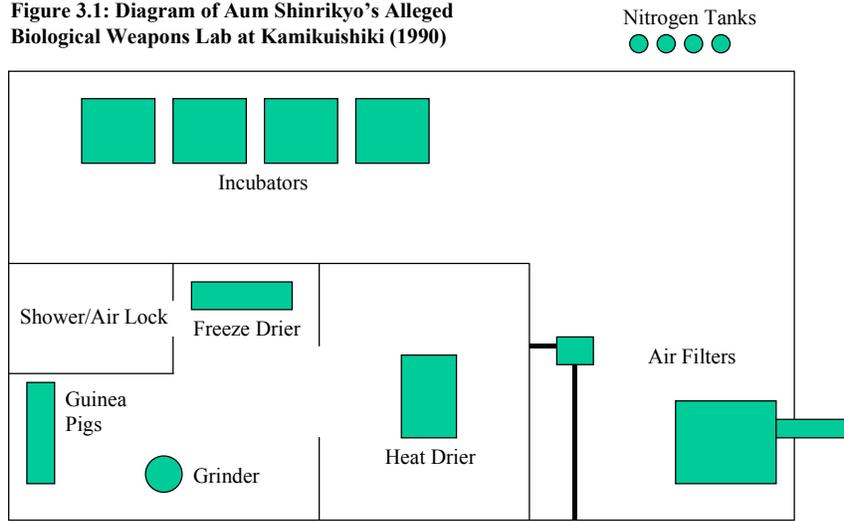
of the deadly virus. During a December 1994 radio broadcast, Endo spoke of Ebola's potential as a biological warfare agent.<sup>20</sup> Other media reports overlaid the cult's forays into genetic engineering, one built upon the sect's purchase of molecular design software.<sup>21</sup>

Years later and with careful investigation, it has become clear that Aum's prowess with these biowarfare agents has been significantly

exaggerated. Aum did not have any equipment capable of growing the Ebola virus, which it apparently never possessed. Moreover, the sect never obtained Q fever either. All the cult had were test kits to diagnose Q fever. Absent seed cultures for these agents, the cult could hardly have succeeded in producing them, much less in genetically modifying these or other agents.<sup>22</sup>

From the outset, Aum's biological program was rife with technical bunglings that the cult's germ corps failed to recognize or was willing to ignore. Determined to move out smartly, they tried to leap from a seed culture to disseminating an agent in record time. In April 1990, just a month after the trip to Hokkaido

**Figure 3.1: Diagram of Aum Shinrikyo's Alleged Biological Weapons Lab at Kamikuishiki (1990)**



Source: Kyle B. Olson, "Overview: Recent Incident and Responder Implications," in *Proceedings of the Seminar of Responding to the Consequences of Chemical and Biological Terrorism*, Office of Emergency Preparedness (Washington, DC: US Public Health Service, Department of Health and Human Services, 11–14 July 1995), page 2-88.

<sup>20</sup> The horse serum work took place at Mount Aso. Asahara even directed his followers to build a stable. Staff Statement, *Global Proliferation of Weapons of Mass Destruction*, 62–4, 93; Kaplan and Marshall, *The Cult at the End of the World*, 96, 233. On Aum's work with Q fever, Karl Lowe, "Analyzing Technical Constraints on Bio-Terrorism: Are They Still Important?" in *Terrorism with Chemical and Biological Weapons: Calibrating Risks and Responses*, ed. Brad Roberts (Arlington, Va.: Chemical and Biological Arms Control Institute, 1997), 59; WuDunn, Miller, and Broad, "Sowing Death." The original reports of Aum's acquisition of Q fever and work with horse serum appeared, respectively, on 22 November 1995 in the *Mainichi Shinbun* and on 27 May 1995 in the *Yomiuri Shinbun*. Personal communication from Mr. Maasaki Sugishima (4 September 2000).

<sup>21</sup> Eliot Marshall, "Bracing for a Biological Nightmare," *Science* 275, no. 5301 (22 October 1997): 745. See also, Barbara Starr, "DARPA Begins Research to Counteract Biological Pathogens," *Jane's Defense Weekly* 28, no. 15 (15 October 1997): 8. Starr quotes two Defense Advanced Research Project Agency officials to the effect that Aum was able to insert an e-coli agent inside botulinum toxin.

<sup>22</sup> See the previous footnote for context. The function of the design software in Marshall's *Science* article was to model organic chemical reactions. The two officials in Starr's *Jane's Defense Weekly* article state that they made no remarks about the cult having established a genetic engineering capability, but Starr's account was reported worldwide more than once and reprinted in an important British medical text. Leitenberg, "The Widespread Distortion of Information," 6–7. Japanese prosecutors have made no mention in court of Aum successfully cultivating Q fever. Personal communication from Mr. Maasaki Sugishima (4 September 2000).

to probe the soil of the Tokachi River for *Clostridium botulinum* strain, Asahara wanted whatever emerged from the fermenter dispersed among his countrymen. A three-vehicle dissemination convoy snaked around Tokyo, the international airport at Narita, and the US naval bases at Yokohama and Yokosuka. One of the vehicles was a large truck with a compressor system and six hidden vents.<sup>23</sup> The sect's members may have thought they were pumping out botulinum toxin, but no passersby were infected. Actually, these would-be germ warriors should have had some idea that no harm would come to pass because none of the test rats at Kamikuishiki that they had exposed to their toxin had died.<sup>24</sup> Aum has been publicly credited with the successful production of botulinum toxin, but evidently the cult's physician, Tomomasa Nakagawa, was unable to isolate *Clostridium botulinum* strain from the Tokachi River soil.<sup>25</sup> In other words, Aum's effort to produce botulinum toxin never really got off the ground.

Aum's biological team also tried their luck with anthrax, an agent that Japanese authorities initially thought the cult succeeded in producing. Aum believed that its followers had obtained a virulent strain of anthrax in 1992, but what they really had was the veterinary vaccine strain.<sup>26</sup> Perhaps unaware that this strain was nonlethal, Endo nonetheless set about cultivating it at in a hermetically sealed laboratory inside the sect's headquarters building in Kameido, the Koto ward of Tokyo.<sup>27</sup> In June and July 1993, the cult twice tried to aerosolize an anthrax slurry from the roof of this eight-story building, where an industrial sprayer with a large

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<sup>23</sup> According to some reports, the cult dispersed what it thought was botulinum toxin in Tokyo on another occasion, targeting the Imperial Palace during the June 9<sup>th</sup> 1993 the wedding of Crown Prince Naruhito and Princess Masako. WuDunn, Miller, and Broad, "Sowing Death"; Kaplan and Marshall, *The Cult at the End of the World*, 58–9, 93–6, 234–6. Japanese prosecutors have not mentioned this attack in court. Prosecutor's statement, 25 April 1996 documents of Asahara's trial in Tokyo District Court, translation provided by Mr. Maasaki Sugishima (1 September 2000). The truck is described in Olson, "Overview: Recent Incident and Responder Implications," page 2-42.

<sup>24</sup> Testimony of Kyle B. Olson, US Congress, Senate Committee on Governmental Affairs, Permanent Subcommittee on Investigations, *Global Proliferation of Weapons of Mass Destruction*, 31 October and 1 November 1995 (Washington, DC: US Government Printing Office, 1996), 111; Kaplan and Marshall, *The Cult at the End of the World*, 97. A similar account was given in a cult member's confession printed in the 14 April 1995 edition of the *Yomiuri Shinbun*. Endo was also attempting to cultivate *C. botulinum* at the Kamikuishiki compound laboratory, where his failed experiments with rats took place. Excerpt of this story provided by Mr. Masaaki Sugishima (1 September 2000).

<sup>25</sup> Prosecutor's statement, 25 April 1996 documents of Asahara's trial in Tokyo District Court. Translation provided by Mr. Maasaki Sugishima (1 September 2000). For the assertion that Aum produced botulinum toxin, attributed to what Japanese authorities believed in 1995, see Staff Statement, *Global Proliferation of Weapons of Mass Destruction*, 62. Stating that the cult did not have a lethal strain, WuDunn, Miller, and Broad, "Sowing Death"; Leitenberg, "The Widespread Distortion of Information," 2; 1999 Gilmore panel report, 50–1. Another explanation given for the failure of the sect's botulinum attack(s) is that insufficient quantities were disseminated to kill anyone. W. Seth Carus, *Bioterrorism and Biocrimes: The Illicit Use of Biological Agents in the 20<sup>th</sup> Century*, Working Paper (Washington, DC: National Defense University, July 1999), 57.

<sup>26</sup> On the acquisition of a veterinary vaccine strain instead, remarks of Mr. Maasaki Sugishima. Presentation at the Association of Politics and the Life Sciences Conference, 1 September 2000, Washington, DC. Some reports said Aum may have gotten this vaccine strain from Tsukuba University, but officials there deny any cooperation with the cult. WuDunn, Miller, and Broad, "Sowing Death." Also, 1999 Gilmore panel report, 50–1. Reporting the early assessment of Japanese authorities, see Staff Statement, *Global Proliferation of Weapons of Mass Destruction*, 62.

<sup>27</sup> Prosecutor's statement, 25 April 1996 documents of Asahara's trial in Tokyo District Court. Translation provided by Mr. Maasaki Sugishima (1 September 2000).

fan was reportedly situated. According to widely repeated accounts based on the police report of the June incident, over a four-day period moon-suited cult members poured anthrax into a steam generator and then through the sprayer and fan.<sup>28</sup> Read more closely, however, the police report indicates that steam was rising from the building, and no industrial capacity sprayer was involved in the incidents.<sup>29</sup> In an interview, a cult member later stated that a pump was employed to try to generate a high pressure aerosol.<sup>30</sup> The police report also notes that those living near Aum's headquarters smelled something malodorous, not specifically that the cult was spreading anthrax for four entire days. The whole foul-smelling episode was inflated. A significant quantity of agent would have been required to release a slurry continuously for four hours, much less four days. Whatever Aum's concoction may have been, it was not deadly anthrax and it could not have posed much of an inhalational threat because people in the area at the time saw clots of jellyfish-like material in the street, a sign of clogging problems during the spraying of a slurry.<sup>31</sup> Aum failed in two other attempts to disperse its anthrax potion in July 1993, when the vented, compressor-pump truck was again sent through the heart of Tokyo.<sup>32</sup>

Aum's attempts and plans to disseminate germ mixtures on additional occasions shed more light on the scope of the cult's biowarfare program and perhaps its folly. In April 1990, Endo reportedly tried to use some type of homemade spraying device to blanket the Diet with a neurotoxin, a fizzled endeavor that resulted in no casualties.<sup>33</sup> That same month, Asahara told the faithful that he planned to use balloon bombs

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<sup>28</sup> In July 1995, several erroneous Japanese media stories based on information supplied by the police appeared. Leitenberg, "Aum Shinrikyo's Efforts to Produce Biological Weapons," 152, fn. 6. Also on this attempted attack, WuDunn, Miller, and Broad, "Sowing Death"; Staff Statement, *Global Proliferation of Weapons of Mass Destruction*, 63; Kaplan and Marshall, *The Cult at the End of the World*, 94–6. Some accounts said that birds were killed, and pets were sickened; but while some people lost their appetites, no one died.

<sup>29</sup> Leitenberg, "The Widespread Distortion of Information," 3–4.

<sup>30</sup> Cult member Fumihiko Joyu claimed that they knew this device, which Murai worked on, would kill the microorganisms. Asahara was told of this problem, but authorized the spraying, described in the interview as a religious exercise to simulate Armageddon. Manabu Miyazaki, "Kameido Anthrax Incident: An Interview with Fumihiko Joyu," *Aum Katai* (Tokyo: Rai-inn Shuppan: 2000), 144–8. Japanese prosecutors state that the device, called "water-mach" was developed by cult members Kazumi Watanabe and Toru Toyoda. Prosecutor's statement, 25 April 1996 documents of Asahara's trial in Tokyo District Court. Translation provided by Mr. Masaki Sugishima (1 September 2000).

<sup>31</sup> Leitenberg, "The Widespread Distortion of Information," 3–4. Japanese prosecutors also attribute the failure of the attack to the high pressure of the dissemination killing the *B. anthracis*. Prosecutor's statement, 25 April 1996 documents of Asahara's trial in Tokyo District Court. Translation provided by Mr. Masaki Sugishima (1 September 2000). Problems with disseminating a liquid slurry are discussed in chapter 2.

<sup>32</sup> Asahara was apparently in one of three vehicles that circled the Japanese Diet and another Tokyo landmark, the Tokyo Tower. Trial testimony of cult member Shigeo Sugimoto as reported in 19 March 1997 edition of *Asahi Shinbun*. Excerpt provided by Mr. Masaki Sugishima (1 September 2000); WuDunn, Miller, and Broad, "Sowing Death."

<sup>33</sup> Kaplan and Marshall, *The Cult at the End of the World*, 57.

to disseminate botulinum toxin across Japan, a plot that never came to fruition.<sup>34</sup> The sect had also procured a Russian helicopter that they intended to equip with a spray device, as well as two remote control drones with spray attachments.<sup>35</sup> According to one media report, Aum was also ascribed with building a crude anthrax bomb, a claim later refuted.<sup>36</sup> The cult did, however, assemble three briefcases with side vents, battery-powered fans, and vinyl tubes to hold biological agent. On 15 March 1995, these attaches were placed in the Kasumigaseki subway station, just five days prior to Aum's sarin attack. The vibration of passing trains was supposed to trip ultrasonic triggers to set off the devices. Authorities found the briefcases, but were unable to retrieve any samples from the small vials inside for analysis.<sup>37</sup> The contents were probably one the cult's toothless microbe mixtures.

Over the space of five years, the cult carried out at least nine biological attacks with what it hoped would be lethal consequences.<sup>38</sup> Japanese experts and cult members have reported that the group's technical incompetence was such that Aum could not get out of the starting block, much less all the way to the successful dissemination of biowarfare agents.<sup>39</sup> Thus, despite the cult's investment of considerable money and time and the participation of graduate-level scientists in the effort, Aum's efforts to isolate, produce, and spread biological agents were, from start to finish, a serial flop.

## AUM'S CHEMICAL WEAPONS PROGRAM

Aum Shinrikyo's novice weaponeers encountered more success with poison gas, as one might expect. There, the cult spared no expense as well, spending an estimated \$30 million on its own capacity to develop,

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<sup>34</sup> This account was given in court by cult member Shigeo Sugimoto and reported in the 19 March 1997 edition of the *Asahi Shinbun*. Asahara may have gotten this idea from Japan's World War II era biological warfare program, which had researched the possibility of agent dispersal via balloons. Excerpt of this report provided by Mr. Masaaki Sugishima (1 September 2000). The old Japanese program is described in Sheldon H. Harris, *Factories of Death: Japanese Biological Warfare 1932-45 and the American Cover-up* (New York: Routledge, 1994).

<sup>35</sup> Staff Statement, *Global Proliferation of Weapons of Mass Destruction*, 63; Olson, "Overview: Recent Incident and Responder Implications," page 2-42.

<sup>36</sup> A bomb capability was reported in Marshall, "Bracing for a Biological Nightmare," 745. For a convincing rebuttal of this assertion. Leitenberg, "The Widespread Distortion of Information," 5.

<sup>37</sup> WuDunn, Miller, and Broad, "Sowing Death"; Kaplan and Marshall, *The Cult at the End of the World*, 235-6; Staff Statement, *Global Proliferation of Weapons of Mass Destruction*, 63; Olson, "Overview: Recent Incidents and Responder Implications," pages 2-37, 2-59.

<sup>38</sup> Kaplan, "Aum Shinrikyo (1995)," 286; WuDunn, Miller, and Broad, "Sowing Death." Note that whether the intent of Aum's biological attacks was to kill indiscriminately has been questioned, since some of the cult members assert that they knew harmless substances were being dispersed. Personal communication from Mr. Masaaki Sugishima (4 September 2000).

<sup>39</sup> WuDunn, Miller, and Broad, "Sowing Death"; Leitenberg, "The Widespread Distortion of Information," 2; 1999 Gilmore panel report, 50-1.

test, produce, and disseminate sarin and other chemical warfare agents.<sup>40</sup> Before trying to create an in-house production capability, the sect first attempted to acquire chemical weapons from countries known to possess them. In 1988, an Aum operative wired a firm that supposedly peddled American weapons but was really a front company for the US Customs Service. A cult member placed an order for five hundred MK94 bombs and MK116 “weteye” bombs apiece. Had filled munitions been delivered, the cult would have been in possession of over 250 tons of sarin, theoretically more than 1.25 billion lethal doses.<sup>41</sup> Aum also attempted to gain chemical munitions, expertise, and recruits from the scientists that built Russia’s chemical arsenal, declared at 40,000 metric tons.<sup>42</sup>

Unable to buy chemical weapons, Aum initiated its own poison gas program in the spring of 1993. This program was headed by Aum’s lead chemist, Masami Tsuchiya, a doctoral candidate specializing in photochemistry at Tsukuba University. The aforementioned Endo and Murai also played supervisory roles.<sup>43</sup> Through two chemical front companies, the cult began a spending binge to amass the requisite chemical ingredients. Aum purchased in quantity and variety from over two hundred Japanese chemical supply companies. Among the more than two hundred chemicals packed into its warehouses were 60 tons of glycerol, 50 tons of phosphorous trichloride, 10 tons of sodium fluoride, 1.5 tons of nitric acid, 1.2 tons of calcium chloride. Other chemicals checked off the shopping list included dimethylamino ethanol, dimethylmethylphosphonate, hydrogen fluoride, methyl iodide, potassium iodide, thiodiglycol, and sodium cyanide.<sup>44</sup>

Stocked with ingredients, Aum’s scientists busied themselves in the cult’s laboratories, exploring and producing chemical agents. Tsuchiya synthesized the nerve agent VX in his private laboratory on four occasions at the cult’s new production facility. In addition, cult chemists reportedly knew their way around tabun, soman, mustard, hydrogen cyanide, and phosgene. Apparently, the cult did not produce these agents in sizable quantities. For example, the cult manufactured a pound of mustard. From one Aum member,

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<sup>40</sup> Kaplan and Marshall, *The Cult at the End of the World*, 87–8, 102, 213–4, 216.

<sup>41</sup> Prepared Statement of Connie J. Fenchel, *Global Proliferation of Weapons of Mass Destruction*, 229.

<sup>42</sup> Kaplan and Marshall, *The Cult at the End of the World*, 107–8.

<sup>43</sup> Tsuchiya stated that one of the reasons he signed on with the cult was that Aum’s laboratories were better than those at Tsukuba University. Sayle, “Nerve Gas and the Four Noble Truths,” 70. Also, “Staff Statement,” *Global Proliferation of Weapons of Mass Destruction*, 61; Brackett, *Holy Terror*, 114–5. Tsuchiya has been described as a “brilliant” chemist. Tu, “Aum Shinrikyo’s Chemical and Biological Weapons,” 48.

<sup>44</sup> The two front companies were Bell Epoch and Hasegawa Chemicals, located in Shizuoka and Tokyo, respectively. Japanese law enforcement authorities seized chemicals in raids at several Aum compounds on 22 March 1995. Anthony T. Tu, “Basic Information on Nerve Gas and the Use of Sarin by Aum Shinrikyo,” *Journal of the Mass Spectrometry Society of Japan* 44, no. 3 (1996): 311. Public sources differ on the amount of chemicals the cult had. See also, Kaplan and Marshall, *The Cult at the End of the World*, 98, 257.

police seized seventeen bottles of sodium cyanide, a total quantity of 8.5 kilograms.<sup>45</sup> Instead, the cult focused its poison gas program on sarin.

Aum's chemical team produced their first batch of the agent that made the cult infamous in the fall of 1993, when they synthesized 20 grams of sarin in a pre-built structure called the Krishitigalva Prefab.<sup>46</sup> Before long, the cult's sarin aspirations outpaced their production capacity. Asahara deemed the laboratory-scale capability at Kamikuishiki inadequate and ordered a new production facility built. Aum Shinrikyo reportedly paid a Russian official approximately \$100,000 for the blueprints for this plant, but a 27-year-old cult member by the name of Kazuyoshi Takizawa has also been credited with being the facility's chief designer. The sarin plant, known as Satyan 7, was erected at a cost of \$10 million on the Mount Fuji compound. The entrance of Satyan 7 was a shrine that disguised the facility's real purpose. Above a huge styrofoam statue of the head of Shiva was the "Room of Genesis," chocked with tanks holding nerve gas precursor chemicals. Behind Shiva was a two-story distillation column. Further into the building were three laboratories, a computer control center, and the fabrication area with its five reactors, injectors, piping, wiring, and heating. The equipment was corrosion-resistant Hastelloy, well-suited for making chemical warfare agents. The fifth reactor in this suite was state-of-the-art—a \$200,000 Swiss-built, fully computerized model with automatic temperature and injection controls plus analytical and record keeping features. The product from this reactor was piped to an industrial packaging machine that deposited the specified amount of liquid into nylon polyethelene bags, which were then heat-sealed.<sup>47</sup> Next door to Satyan 7 was a laboratory that alone cost an estimated \$1 million to build, filled with hundreds of thousands of dollars of analytical equipment.<sup>48</sup>

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<sup>45</sup> Tsuchiya confessed to having made VX, which the cult wielded as a tool in at least three assassination attempts against its opponents, killing one. Tu, "Aum Shinrikyo's Chemical and Biological Weapons," 75, 79. See also, Pamela Zurer, "Japanese Cult Used VX to Slay Member," *Chemical & Engineering News* (31 August 1998): 7. Aum attempted to use hydrogen cyanide in two foiled terrorist attacks. Under ideal dissemination conditions, this quantity of sodium cyanide could kill well over fifty thousand people. Kaplan, "Aum Shinrikyo (1995)," 293; Kaplan and Marshall, *The Cult at the End of the World*, 150, 211; Staff Statement and Testimony of John F. Sopko, *Global Proliferation of Weapons of Mass Destruction*, 21–2, 61–2, 87–8; Brackett, *Holy Terror*, 110, 113–4, 118, 146, 157, 175.

<sup>46</sup> The quantity of sarin made in October 1993 was 20 grams; 1 kilogram in November 1993; 5 kilograms in December 1993; and 20 kilograms at the Satyan 7 facility from February to March 1994. The last of these batches was used in the late June 1994 attack in Matsumoto. Tu, "Basic Information on Nerve Gas," 309; Anthony T. Tu, "Chemistry and Toxicology of Nerve Gas Incidents in Japan in 1994 and 1995," Paper presented at the Third Congress of Toxicology in Developing Countries, 1 September 1996, Cairo. Also, Kaplan and Marshall, *The Cult at the End of the World*, 131, 140.

<sup>47</sup> Each of the laboratories contained sophisticated equipment, such as \$10,000 infrared spectrometers to separate and analyze chemical compounds. The facility was so advanced that it had a fluorine treatment capacity, a feature that numerous Western laboratories bypass because of its expense. The individual who reportedly sold Aum the blueprints for the plant was the secretary of the Russian Security Council, Oleg Lobov. Kaplan and Marshall, *The Cult at the End of the World*, 119–20, 216, 259. Kaplan, "Aum Shinrikyo (1995)," 293–5. See also, Olson, "Overview: Recent Incident and Responder Implications," page 2-42. On Takizawa as the chief designer of Satyan 7, Tu, "Aum Shinrikyo's Chemical and Biological Weapons," 48, 79.

<sup>48</sup> Brackett, *Holy Terror*, 115.

Satyan 7 had some built-in safety features, such as hatchways that sealed off rooms in the event of accidents, ventilation, and a decontamination chamber. Technicians wore gas masks and full-body chemical suits during certain operations, such as sampling. Closed-circuit television recorded activities in the production area.<sup>49</sup> Yet, buckets were placed around the plant to catch leaks, an indication in the words of one analyst that “the cult had a high degree of book learning but virtually nothing in the way of technical skill.”<sup>50</sup> Nonetheless, Asahara decreed ambitious production goals for Satyan 7. The sect’s chief scientist, Murai, projected that the plant would manufacture 70 tons of the nerve agent within forty days of starting operation. The daily target was 2 tons, with the yield of each batch set at 17.6 pints of sarin. As Satyan 7 came on line in 1993, Asahara ordered the number of those working in Aum’s hi-tech division—the Supreme Truth Research Institute of Science and Technology—increased from eighteen scientists, engineers, and technicians to over one hundred.<sup>51</sup>

Under a certain amount of pressure because the cult’s biological concoctions were not achieving the desired results, Aum’s chemical corps took steps to prove that its sarin would indeed kill. Partly to incite a war in Japan that might give rise to his predicted apocalypse and partly to test the sarin’s toxicity, Asahara ordered an attack on the leader of a rival religious sect. On two successive evenings in the spring of 1994, the cult twice sprayed sarin from a mechanism affixed to a van. On the first attempt, the sprayer completely malfunctioned and sprayed backwards, and on the second the cult’s security chief, Tomomitsu Niimi, was exposed to sarin. Quick administration of nerve agent antidotes saved his life.<sup>52</sup> Further tests on live subjects would take place at a ranch that the sect purchased in September 1993 in the Australian outback called Banjawarn Station. A field testing facility of sorts, the ranch had a laboratory that was fully outfitted with computers, various types of digital equipment, and standard items such as bunsen burners, glass evaporators, and ceramic grinding and mixing bowls. On hand as well were noteworthy quantities of assorted acids and toxic chemicals. When Australian police later investigated the homestead, they found the remains of twenty-nine sheep. Authorities also came across a Japanese language document indicating that the sheep might have met their fate as a result of experiments, a possibility turned probability when tests on the wool and soil

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<sup>49</sup> Kaplan and Marshall, *The Cult at the End of the World*, 120, 150, 259. Aum Shinrikyo also had a Russian-made GSP-11 toxic gas detector at Kamikuishiki, but it is not known whether this detector was used at Satyan 7. Prepared Statement of Gordon C. Oehler, *Global Proliferation of Weapons of Mass Destruction*, 216.

<sup>50</sup> Olson, “Overview: Recent Incident and Responder Implications,” page 2-42.

<sup>51</sup> Testimony of John F. Sopko, *Global Proliferation of Weapons of Mass Destruction*, 21; Kaplan and Marshall, *The Cult at the End of the World*, 120–1, 149. One source put the total staffing level at three hundred, Brackett, *Holy Terror*, 116. Another source states that eighty scientists were engaged in manufacturing sarin and other chemical agents, Tu, “Aum Shinrikyo’s Chemical and Biological Weapons,” 50.

<sup>52</sup> The target of this attack was Daisaku Ikeda, the leader of the Soka Gakkai Buddhist organization. Tu, “Chemistry and Toxicology of Nerve Gas Incidents in Japan in 1994 and 1995,” 84; Kaplan and Marshall, *The Cult at the End of the World*, 131–3. Another version of this attack describes only one attempt, during which the dispersal system caught fire. Brackett, *Holy Terror*, 29. On the backwards spraying in the first attempt, personal communication from Dr. Anthony Tu (6 October 2000).

samples revealed trace residues of sarin.<sup>53</sup> By gassing the sheep, the cult had obtained unmistakable proof of their sarin's lethality.

Aside from the accident with Niimi, other shortcomings of Aum's safety procedures were soon evident. Inside Satyan 7, several laboratory technicians inhaled fumes on repeated occasions and exhibited symptoms ranging from nosebleeds to convulsions.<sup>54</sup> Production problems also became apparent when toxic chemicals began to leak from the site. Citizens living nearby lodged numerous complaints with the police in July 1994 of noxious fumes coming from the Kamikuishiki compound. Aum Shinrikyo denied any wrongdoing, stating instead that US forces had assaulted the cult with poison gas. In November 1994, an accident forced the suspension of agent production operations. Police took soil samples from just outside the compound and found concrete evidence of sarin production at a time when police knew that the very same chemical agent had been used in a June 1994 attack in Matsumoto, described below. Japanese police had this sample evidence four months before the Tokyo subway gas attack. Police could not prosecute Aum at that time, however, because no law prohibited the manufacture of poison gas. Until their case against the cult was airtight, Japanese law enforcement authorities would not make any arrests.<sup>55</sup> Police sat on the evidence that the cult was manufacturing sarin, but on 1 January 1995 the *Yomiuri Shinbun*, a leading newspaper, published the story, alerting Asahara and his lieutenants that the police had finally begun to suspect them of serious foul play.<sup>56</sup>

## DEADLY DRESS REHEARSAL AT MATSUMOTO<sup>57</sup>

On June 27<sup>th</sup> 1994, a rented minivan and an ordinary looking refrigerated delivery truck departed the Aum compound for the mountain city of Matsumoto, taking the back roads instead of expressways, where cameras record license plates. Inside the truck, a group of six men contemplated their assignment from

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<sup>53</sup> Kaplan and Marshall, *The Cult at the End of the World*, 127–9, 133; The Australian Investigation of the Aum Shinrikyo Sect, Staff Statement, and Testimony of Alan Edelman, in *Global Proliferation of Weapons of Mass Destruction*, 32, 75, 613. The cult apparently intended to mine uranium ore, a base material for nuclear weapons, from this site. Brackett, *Holy Terror*, 93–4, 114.

<sup>54</sup> Brackett, *Holy Terror*, 116.

<sup>55</sup> Citizen complaints were filed on July 7<sup>th</sup> and 15<sup>th</sup> 1994. The accident occurred on November 16<sup>th</sup>. Gas chromatograph-mass spectrometry analysis found methylphosphonic acid, a degradation byproduct of sarin manufacture. Anthony T. Tu, "Overview of Sarin Terrorist Incidents in Japan in 1994 and 1995," Proceedings from the 6<sup>th</sup> CBW Protection Symposium (Stockholm: 10–15 May 1995), 14–5. Also, Brackett, *Holy Terror*, 116–7. On the challenges of operating a production facility safely and briefly on Aum's numerous accidents, Richard A. Falkenrath, Robert D. Newman, and Bradley A. Thayer, *America's Achilles' Heel: Nuclear, Biological, and Chemical Terrorism and Covert Attack* (Cambridge, Mass.: MIT Press, 1998), 24.

<sup>56</sup> Tu, "Chemistry and Toxicology of Nerve Gas Incidents in Japan in 1994 and 1995," 86, 95.

<sup>57</sup> Hugo Gurdon, "Seven Die as Poison Gas Engulfs Flats," *The Daily Telegraph*, 29 June 1994; "Screams, Sirens Signaled Tragedy," *The Daily Yomiuri*, 29 June 1994.

Asahara concerning three district court judges hearing a civil suit that had been filed challenging the legality of Aum's purchase of a piece of land. To preempt an anticipated unfavorable ruling, their mission was to gas the three judges and whomever else happened to be unfortunate enough to be around at the time.<sup>58</sup>

En route to Matsumoto, the assassination team stopped to alter the license plates and purchase uniforms as disguises. By the time the slow convoy reached the ancient city, the judges had left the courthouse for their homes, so the cult members improvised and headed for a residential area in the northern part of town. The truck, customized to disperse poison gas, pulled into a supermarket parking lot around 10:00pm.<sup>59</sup> With those in the minivan serving as the lookouts, the team of assassins in the truck began their final preparations. A doctor administered a sarin antidote to the truck's occupants. The assassins then donned improvised gas masks hardly deserving of the name—inflated plastic bags with oxygen feed tubes—before repositioning the two vehicles in a parking area closer to the dormitory where the judges lived. There, around 10:40pm, the team opened a window in the side of the truck, turned on a heater, a fan, and a computer system, and cranked open a valve that released a slow drip of liquid sarin onto a heater. Even though the cult had previously conducted a live-agent test with the fan delivery system, this operation did not go smoothly. A white mist filled the truck, the result of too much isopropyl alcohol having been put into the sarin. After several moments of panic inside the truck, the fan began to blow the toxic vapor out the window, where the cultists left the wind to take care of the rest. The spraying continued for roughly twenty minutes. Fortunately for the judges, the wind did not cooperate and all three jurists survived.<sup>60</sup> Before departing the area, Aum's assassination team dispersed about 20 kilograms of sarin.<sup>61</sup> The agent had been synthesized from February to March 1994 in the Kushiti Galva Prefab at the Kamikuishiki compound.<sup>62</sup>

The gas wafted over an elliptical area measuring 800 by 570 meters, affecting most intensely those in a smaller 400 by 300 meter region. The evening was warm, so seven unwary residents in the area made

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<sup>58</sup> Kaplan and Marshall, *The Cult at the End of the World*, 138–9; Sopko, “The Changing Proliferation Threat,” 13. The original attack plan called for the cult to spray sarin into the courthouse where the judges worked in broad daylight. Brackett, *Holy Terror*, 27–8.

<sup>59</sup> The spraying device used at Matsumoto was developed by a 37-year-old mechanical engineer, Kazumi Watanabe. Tu, “Aum Shinrikyo's Chemical and Biological Weapons,” 48. On the events leading up to the attack, Kaplan and Marshall, *The Cult at the End of the World*, 137–41, 144; Brackett, *Holy Terror*, 32–4.

<sup>60</sup> Near the Fuji River estuary, the cult conducted a live-agent test with the fan delivery system, which was powered by thirty batteries weighing 1,000 pounds. The container of sarin was secured with bolts to the truck's load platform. The antidote that was administered was probably atropine. Only one of the jurists was hospitalized, along with his wife. All three judges were too ill to work for a while, so the ruling was postponed. Kaplan and Marshall, *The Cult at the End of the World*, 137–41, 144; Brackett, *Holy Terror*, 32–4.

<sup>61</sup> Japanese prosecutors estimated the amount of sarin released. Testimony of John F. Sopko, *Global Proliferation of Weapons of Mass Destruction*, 21. Kaplan and Marshall, *The Cult at the End of the World*, 144.

<sup>62</sup> Tu, “Basic Information on Nerve Gas,” 309–10. According to another source, the sarin used in this attack was made ten days beforehand in a Satyan 7 laboratory. Brackett, *Holy Terror*, 29.

the fatal mistake of going to bed with their windows open. Those who came down with a runny nose, cough, and shortness of breath, followed by dim and blurred vision may have thought a cold was oncoming, but they were suffering the first symptoms of sarin exposure. The death toll probably would have been higher had windows not been closed elsewhere in the community. The first emergency call was made at 11:09pm, and before long just under one hundred white-gloved police, firefighters from five departments in municipalities near Matsumoto, and emergency medical personnel rushed to the stricken neighborhood. Within an hour, the chief fire officer at the scene declared a mass disaster caused by an unknown toxic gas. Those injured were sent to six hospitals, where physicians proceeded somewhat cautiously. The doctors could treat only what they were observing—clinical symptoms consistent with severe organophosphate poisoning. Only later would laboratory analyses reveal the culprit to be sarin. Hospitals admitted fifty-eight people, seven of whom lost their lives, and an additional 253 sought medical care at outpatient clinics.<sup>63</sup>

Matsumoto police initially suspected that a local man, Yoshiyuki Kono, formerly a salesman for a chemical company, was responsible for the incident. Kono was the first of many who had called for help that night, but after police found nineteen chemicals in his home and traces of sarin in his fish pond, they declared that his attempts to make an herbicide for his garden had gone grossly awry.<sup>64</sup> The National Research Institute of Police Science, which had analyzed the samples, subsequently predicted that another sarin release would take place.<sup>65</sup> In September 1994, an eleven-page epistle on the Matsumoto sarin attack was sent to Japan's major media outlets, signed only with several initials. The document asserted that Aum Shinrikyo was responsible for the attack because sarin could not be manufactured from the chemicals in Kono's private stash. A second anonymous letter claimed that Matsumoto was an open-air "experiment of sorts" and noted that the results would be much worse if sarin were released indoors, for example in a "crowded subway."<sup>66</sup> Asahara and his followers made television appearances to blame the tragedy on US

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<sup>63</sup> The next morning, dead fish and crayfish were found in a pond near the incident site. From samples taken from this pond, inside the victims' homes, and other locations, and within two weeks authorities positively identified sarin using gas chromatography, mass spectroscopy, chemical ionization, and other methods. Traces of sarin, phosphoric acid, and di-isopropyl were also found in the dead victims. For more on the patients' symptoms and treatment, see Dr. Nobu Yanagisawa, "Matsumoto, Japan (June 1994)," in *Proceedings of the Seminar on Responding to the Consequences of Chemical and Biological Terrorism*, pages 2-13-18, 2-20; Hiroshi Okudera et al., "Unexpected Nerve Gas Exposure in the City of Matsumoto: Report of Rescue Activity in the First Sarin Gas Terrorism," *American Journal of Emergency Medicine* 15, no. 5 (September 1997): 528. Note that the casualty figures in these accounts differ slightly, and a survey later revealed that another 277 people experienced symptoms of sarin exposure but did not seek medical assistance. The seven who died were located in three buildings in close proximity to the parking lot where the sarin was released. Brackett, *Holy Terror*, 37.

<sup>64</sup> Gwen Robinson, "Japanese Weedkiller Cocktail Kills Seven," *The Times*, 29 June 1994. For a detailed accounting of the development, and subsequent retraction, of the allegations by the police and the media against Kono, see Teresa Watanabe, "Japan's Media: How Watchful an Eye? Investigations into Nerve Gas Attacks Create a Dilemma for the Passive Press," *Los Angeles Times*, 2 June 1995. Also, Brackett, *Holy Terror*, 37-43; Kaplan and Marshall, *The Cult at the End of the World*, 144-6.

<sup>65</sup> Tu, "Basic Information on Nerve Gas," 308-9.

<sup>66</sup> Kaplan and Marshall, *The Cult at the End of the World*, 144-6.

Navy pilots, who they said had bombed Matsumoto with poison gas.<sup>67</sup> As the media and law enforcement authorities puzzled over who was behind these letters and the deadly toxic assault, someone in the cult crafted a little ditty to immortalize the Matsumoto attack, one of several songs meant to inspire the workers in Aum's poison gas factory at Kamikuishiki.<sup>68</sup>

## ANATOMY OF THE MARCH 20<sup>TH</sup> ATTACK

At long last, police finally got the legal pretext they needed to raid the Kamikuishiki compound when they found fingerprint evidence that an Aum member was linked to a suspected kidnaping. Aware that Aum Shinrikyo was making poison gas inside, the National Police Agency ordered gas masks and protective gear for three hundred officers from the Self Defense Forces. They also sent five hundred police officers quickly through last-minute chemical training at the Self Defense Forces Chemical School at Omiya. Two cult members inside the Self Defense Forces passed word to Asahara that a crackdown was coming on March 22<sup>nd</sup>.<sup>69</sup> To dissuade Tokyo police from raiding Aum's facilities, Asahara and his key lieutenants hastily threw together the subway sarin attack plan over the weekend. The cult nevertheless pinned down the operational details methodically. At 3:00pm on March 18<sup>th</sup>, a hand-picked group of attackers gathered to select which subway lines to accost. The plotters wanted a sarin-armed cult member on trains going in both directions on the Hibiya, Marunouchi, and Chiyoda lines, which would intersect shortly after 8:00am at Kasumigaseki station, the subway stop nearest police headquarters. This timing was chosen because the trains would be filled with police arriving for the 8:30am shift change.<sup>70</sup>

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<sup>67</sup> Sayle, "Nerve Gas and the Four Noble Truths," 68.

<sup>68</sup> The lyrics of "Song of Sarin, the Brave" went as follows:  
*In the peaceful night of Matsumoto City  
 People can be killed, even with our own hands,  
 The place is full of dead bodies all over,  
 There! Inhale Sarin, Sarin,  
 Prepare Sarin! Prepare Sarin!  
 Immediately poisonous gas weapons will fill the place.  
 Spray! Spray! Sarin, the Brave, Sarin.*

Excerpt from Aum Shinrikyo's manual on sarin manufacture, dated 20 December 1994, as quoted in Staff Statement, *Global Proliferation of Weapons of Mass Destruction*, 60–1. The manual included chemical processes and other songs glorifying sarin. Cult members apparently had pet names for the sarin, such as Magic, Witch, and Sally. They tagged Satyan 7 the Wizard. Kaplan and Marshall, *The Cult at the End of the World*, 121.

<sup>69</sup> Brackett, *Holy Terror*, 121–4. On rush training of the police, Olson, "Overview: Recent Incidents and Responder Implications," page 2-38.

<sup>70</sup> Brackett's account has Murai, at Asahara's behest, chairing this meeting in his room at 3:00pm on the 18<sup>th</sup>; Kaplan and Marshall's has Asahara overseeing the planning at 11:30pm on the 17<sup>th</sup> at an Aum-operated restaurant in Tokyo; Tu's account has Asahara leading an initial meeting in his Rolls Royce returning from the aforementioned dinner, followed by a second planning meeting in Murai's office at 3:00pm on the 18<sup>th</sup>. Brackett, *Holy Terror*, 126–7; Kaplan and Marshall, *The Cult at the End of the World*, 237–8; Tu, "Aum Shinrikyo's Chemical and Biological Weapons," 55, 57. The cult's goal has been described as to "kill as many policemen as possible." Kyle B. Olson, "Aum Shinrikyo: Once and Future Threat?" *Emerging Infectious Diseases* 5, no. 4 (July/August 1999): 516; Olson, "Overview: Recent Incident and Responder Implications," page 2-38; Tu, "Overview of Sarin Terrorist Incidents in Japan in 1994 and 1995," 15.

That same day, a key chemical, difluoromethylphosphonate, that had been hidden at the Kamikuishiki compound was retrieved so that Endo could make a batch of sarin under chief chemist Tsuchiya's supervision. Murai, who is said to have ordered Tsuchiya to dilute future batches of sarin after the Matsumoto attack, was also personally involved in the synthesis of roughly 2 gallons of sarin on the night of March 18<sup>th</sup>. The sarin was made painstakingly, with one chemical added drop by drop. Still, the group knew that their product contained a large number of impurities because it had been made in such a rush.<sup>71</sup> After synthesizing the agent in an older building known as the Jivaka Prefab, four top cult members moved the over to Satyan 7 for the next phase of the operation. There, they poured some 20 ounces of sarin apiece into eleven plastic bags that sat in a second, larger plastic liner. The attackers were instructed to mask the bags with newspapers.<sup>72</sup>

On March 19<sup>th</sup>, the assault team gathered at an Aum-owned condominium in Tokyo to review their assignments, setting out at 10:00pm for a final reconnaissance mission in the subway to pin down the frequency of train arrivals and departures, the length of time that subway doors remained open during stops, and which train cars would put the attackers closest to station exits.<sup>73</sup> The designated attackers returned to Kamikuishiki at 3:00am for some last-minute drilling. Using umbrellas that had had their tips sharpened specifically for the mission, the assault team practiced puncturing water-filled bags.<sup>74</sup> Before they left the compound, the sarin bagmen were issued antidote pills to take two hours prior to the attack, as well as a syringe of another fast-acting antidote in case they got trapped aboard their train after piercing their bags.<sup>75</sup> Late on the night of March 19<sup>th</sup>, a second Aum assault team firebombed the sect's Tokyo headquarters, doing little damage but hoping to mislead Tokyo police with scattered leaflets that threatened Asahara and attributed to the bombing to another cult.<sup>76</sup>

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<sup>71</sup> Chemicals were destroyed or hidden in various places because early in January 1995, aware that the police were closing in on them, Asahara ordered Tsuchiya to disassemble Satyan 7, which was then turned into a worship hall. Media were invited to tour the facility in February 1995 to dispel concerns about the cult. Endo reportedly informed Asahara that the agent was diluted, but Asahara insisted the attack go forward on Monday morning, as planned. Brackett, *Holy Terror*, 39, 117–8, 125; Kaplan and Marshall, *The Cult at the End of the World*, 242–3. On adding isopropyl alcohol drop by drop and the use of homemade oxygen masks during the sarin manufacture, Tu, "Aum Shinrikyo's Chemical and Biological Weapons," 55.

<sup>72</sup> The nylon-polyethylene bags, which the cult manufactured, measured 50 by 70 centimeters. Kaplan and Marshall, *The Cult at the End of the World*, 236, 239–43; Olson, "Overview: Recent Incident and Responder Implications," page 2-40; Staff Statement, *Global Proliferation of Weapons of Mass Destruction*, 61; Tu, "Overview of Sarin Terrorist Incidents in Japan," 15, 18.

<sup>73</sup> Kaplan and Marshall, *The Cult at the End of the World*, 242; Brackett, *Holy Terror*, 127–8.

<sup>74</sup> Brackett, *Holy Terror*, 126, 128–9; Tu, "Overview of Sarin Terrorist Incidents in Japan," 15.

<sup>75</sup> The antidote pill was pyridostigmine bromide. In case of an accident, the attackers were given syringes of atropine and pyridine-2-aldoxime-methylchloride, which counteract the effects of nerve agents. Tu, "Aum Shinrikyo's Chemical and Biological Weapons," 58; Brackett, *Holy Terror*, 129; Kaplan and Marshall, *The Cult at the End of the World*, 243.

<sup>76</sup> Kaplan and Marshall, *The Cult at the End of the World*, 241–2; Tu, "Aum Shinrikyo's Chemical and Biological Weapons," 55.

The assault team had little time to rest by the time they got back to the condominium in Tokyo. Between 6:00 and 6:30am, five assault teams—one subway rider paired with a getaway driver—left the condominium so that the attackers could board their assigned trains at the designated times. Among the Monday morning commuters moving through the subway stations were five Aum members, one toting three sarin-filled packages and the other four, two apiece. As diagramed in figure 3.2, between 7:46am and 8:01am, the attackers stabbed the plastic liners with the umbrellas and stepped off their trains several stations away from Kasumigaseki. Outside, the assailants met their getaway drivers.<sup>77</sup> Meanwhile, the trains continued toward the city center, and the packages that had been left sitting on the floor began to seep sarin vapor and liquid agent. Of the eleven bags, eight were ruptured and three were recovered intact. Police later estimated that a total of 159 ounces of sarin were released on the five subway trains hit.<sup>78</sup>

Some commuters did not notice a smell before the fumes began to choke them, others described odors like burning rubber or mustard, as well a clear, gooey substance on the floor.<sup>79</sup> Figure 3.2 shows where trains halted their runs. On the Marunouchi line, going in the direction of Ikebukuro, the train reached the end of its run and was returning to the city center before passengers asked subway officials to remove foul-smelling objects from the train. The effects of the sarin were much more pronounced on the other four lines, as passengers began coughing, collapsing, vomiting, and convulsing within a few stops from where the sarin had been released. In more than one station, attendants were also confronted with unconscious passengers in trains or on station platforms. Before long, subway operators would shut down all three subway lines and

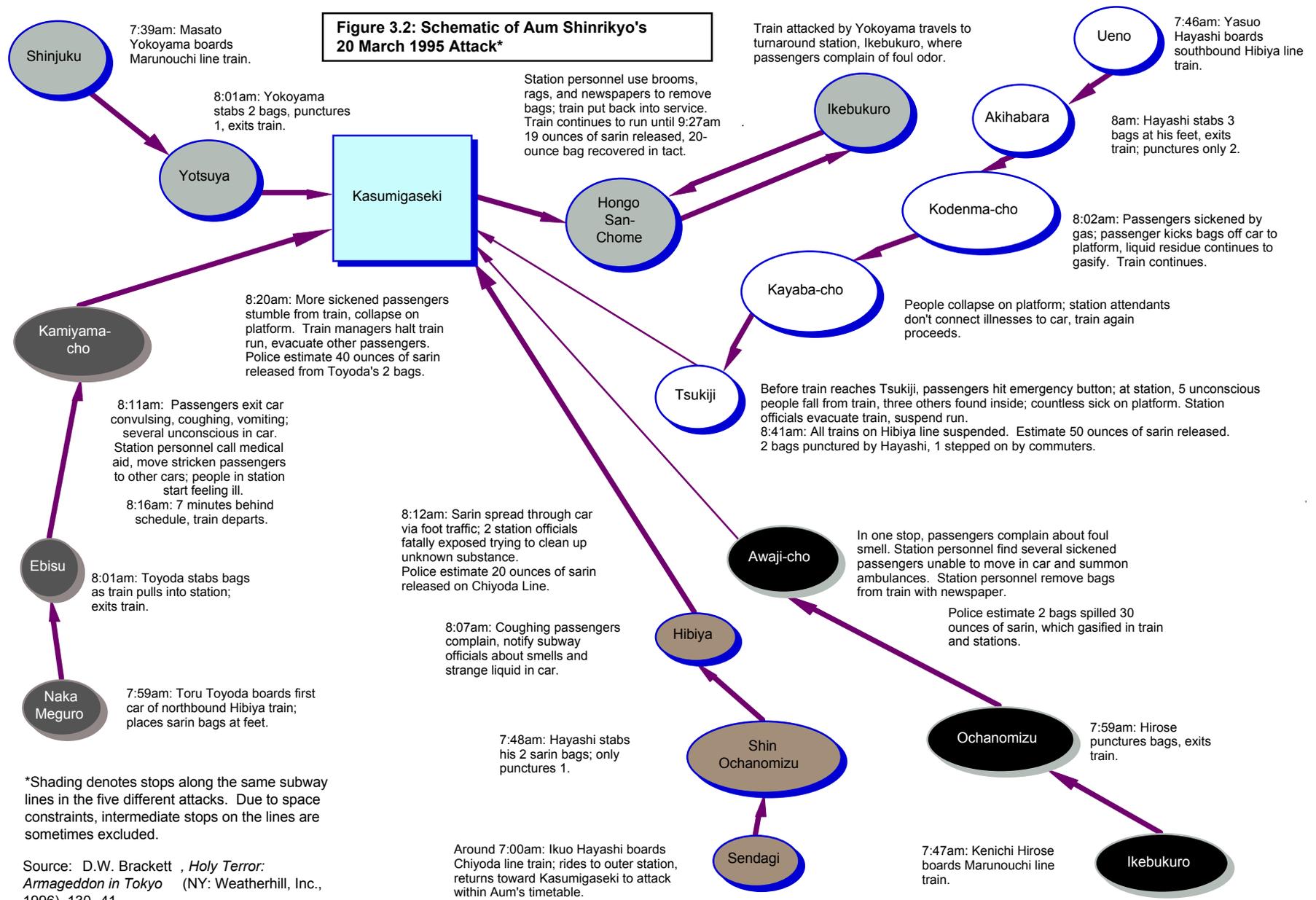
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<sup>77</sup> The most detailed account of the attack can be found in Brackett, *Holy Terror*, 132–4. On the exact timing of the sarin releases on the five subway trains, Tu, “Overview of Sarin Terrorist Incidents in Japan in 1994 and 1995,” 16. Also, Kaplan and Marshall, *The Cult at the End of the World*, 244–6.

<sup>78</sup> Brackett, *Holy Terror*, 134–40.

<sup>79</sup> On the lack of a smell, Dr. Fred Sidell, “US Medical Team Briefing,” in *Proceedings of the Seminar on Responding to the Consequences of Chemical and Biological Terrorism*, pages 2-31–2.

**Figure 3.2: Schematic of Aum Shinrikyo's 20 March 1995 Attack\***



\*Shading denotes stops along the same subway lines in the five different attacks. Due to space constraints, intermediate stops on the lines are sometimes excluded.

Source: D.W. Brackett, *Holy Terror: Armageddon in Tokyo* (NY: Weatherhill, Inc., 1996), 130-41.

twenty-six stations as well.<sup>80</sup> The most injuries occurred on the Hibiya line, with the heaviest count at Tsukiji station, followed by Kayabacho and Kodenmacho stations.<sup>81</sup>

## **TOKYO'S RESCUE AGENCIES AND HOSPITALS RESPOND TO THE AUM ATTACK**

The Tokyo fire department received its first emergency call within minutes of the sarin release, at 8:09am. Before long, the switchboard registered similar calls from multiple subway stations. Although calls for aid came from fifteen subway stations in under an hour, authorities did not understand that the unfolding emergency had a single cause. In March 1995, Tokyo's emergency medical response corps consisted of 1,650 Emergency Medical Technicians (EMTs) staffing 182 teams. As the crisis mounted, authorities dispatched 131 ambulances and 1,364 EMTs to the downtown subway stations on the Hibiya, Marunouchi, and Chiyoda lines. EMTs, police, and fire personnel were clad in routine work clothing, which in the case of the police and EMTs did not include gear to protect them against toxic substances (e.g., respirators).<sup>82</sup> Roughly forty minutes into the response, orders would go out from the National Police Agency that any rescuers going into the subway system had to wear gas masks.<sup>83</sup>

Rescue crews found pandemonium, with scores of commuters stumbling about, vision-impaired, and struggling to breathe. Casualties littered the sidewalks and subway station exits, some foaming at the mouth, some vomiting, and others prone and convulsing. Adding to the chaos, television helicopters hovered noisily overhead to broadcast the scene.<sup>84</sup> Inside subway stations and near the exits, EMTs began to triage victims

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<sup>80</sup> Brackett, *Holy Terror*, 136–42. According to one survey, 31.7 percent of the commuters experienced the onset of exposure symptoms while on the subway train, 43.3 percent while on the subway platform, 15.2 percent in the area of the station but not on the platform, and 9.7 percent in areas outside of the subway station. Some victims apparently left the scene before the onset of exposure symptoms. Y. Ogawa et al., “An Attack with Sarin Nerve Gas on the Tokyo Subway System and Its Effects on Victims,” in *Natural and Selected Synthetic Toxins: Biological Implications*, ed. Anthony T. Tu and W. Gaffield (London: Oxford University Press, 2000), 333–55.

<sup>81</sup> Interview with author: St. Luke's Physician (28 October 1999). On the Hibiya line, 2,475 were injured and seven dead on the line to Meguro, and 532 harmed and one dead on the line to East Zoo Park. On the Marunouchi line to Ogikubo, 358 were injured and one died, and on the line headed to Ikebukuro, two hundred were hurt but none died. On the Chiyo line, there were two deaths and 231 injuries. Tu, “Overview of Sarin Terrorist Incidents in Japan in 1994 and 1995,” 16.

<sup>82</sup> Tetsu Okumura et al., “The Tokyo Subway Sarin Attack: Disaster Management, Part 1: Community Emergency Response,” *Academic Emergency Medicine* 5, no. 6 (June 1998): 614–5. Also on the number of subway stations affected, Central Intelligence Agency, *The Chemical and Biological Weapons Threat* (Washington, DC: Nonproliferation Center, March 1996), 7; Olson, “Overview: Recent Incident and Responder Implications,” page 2-38.

<sup>83</sup> Brackett, *Holy Terror*, 2.

<sup>84</sup> Kaplan and Marshall, *The Cult at the End of the World*, 247. Note that video and photographs of the incident show many rescuers without masks.

and offer medical assistance, although they administered no remedial drugs and did not intubate serious cases at the scene.<sup>85</sup> Nor did they decontaminate the victims.<sup>86</sup>

The EMTs loaded the most seriously affected patients into ambulances and departed for hospitals. With so many rescue vehicles activated, regular communications channels were clogged. Ambulance crews were unable to get through to the ambulance dispatch center to determine which hospitals could receive patients, so some stopped at pay telephones to try to secure instructions directly from hospitals. As the scale of the emergency became apparent, the Tokyo fire department summoned back-up personnel. Heeding this call, forty-seven doctors and twenty-three nurses reported to the scene to find that the most severe cases already en route to hospitals. Inside the ambulances, some cases at first evaluated as mild worsened during the ride. In addition, some of the EMTs pulled into ambulance bays beginning to exhibit symptoms similar to those they were trying to help.<sup>87</sup>

At St. Luke's International Hospital, which is located within three kilometers of five of the affected subway stations, doctors were notified at 8:16am of a disaster, described as a gas explosion. They began to prepare for patients with burns and carbon monoxide poisoning. Twelve minutes later, the first victims arrived *on foot* at the emergency department. At 8:40am, the first of many ambulances pulled into St. Luke's emergency department,<sup>88</sup> as noted in the incident chronology in box 3.1. Since the patients did not have the expected injuries, doctors asked the EMTs for information. The ambulance crews did not know what had occurred, but they thought perhaps that tear gas had been released. The doctors had received word of deaths at the scene, however—an outcome that tear gas would not have caused.<sup>89</sup>

Approximately five hundred patients inundated St. Luke's from roughly 8:40 to 9:40am.<sup>90</sup> The casualties surfaced not just at the emergency department, but at St. Luke's other two entrances as well. Hospital administrators put the facility on an emergency footing, canceling routine surgeries and outpatient

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<sup>85</sup> Okumura et al., "The Tokyo Subway Sarin Attack: Part 1," 614–5; Sidell, "US Medical Team Briefing," page 2-33.

<sup>86</sup> Okumura et al., "The Tokyo Subway Sarin Attack: Part 1," 615. Similarly, rescuers in Matsumoto did not decontaminate victims in June 1994. Okudera et al., "Unexpected Nerve Gas Exposure in the City of Matsumoto," 528.

<sup>87</sup> Okumura et al., "The Tokyo Subway Sarin Attack: Part 1," 615.

<sup>88</sup> Tetsu Okumura et al., "The Tokyo Subway Sarin Attack: Disaster Management, Part 2: Hospital Response," *Academic Emergency Medicine* 5, no. 6 (June 1998): 619. Tsukiji subway station, which is very close to St. Luke's, had the most casualties, followed by Kayabacho and Kodenmacho stations. Interview with author: St. Luke's Physician, Tokyo (29 October 1999).

<sup>89</sup> Interview with author: St. Luke's Physician, Tokyo (30 October 1999).

<sup>90</sup> Okumura et al., "The Tokyo Subway Sarin Attack, Part 2," 619.

**Box 3.1: Timeline of Events Associated with the Tokyo Subway Attack**

7:46am to 8:01am: Members of Aum Shinrikyo release a diluted form of the nerve agent sarin on the Marunouchi, Chiyoda, and Hibiya subway lines.

8:09am: The Tokyo fire department receives the first emergency call. Within an hour, emergency calls are coming from fifteen subway stations. Authorities did not recognize that all of these calls resulted from a single cause.

8:16am: The fire department calls St. Luke's International Hospital Emergency Department, reporting as a gas explosion. The hospital prepares to receive patients with burn and carbon monoxide poisoning.

8:28am: On foot, the first three patients arrive on foot at St. Luke's, followed in a few moments by about twenty additional victims, all complaining of mild exposure symptoms (e.g., eye pain, mild dyspnea, lacrimation).

8:40am: The first ambulance arrives at St. Luke's at the same time that the hospital is warned that it will probably receive several more hundred patients in the near future. Three minutes later, a private vehicle brings in a victim in cardiac arrest. In the next hour, about five hundred patients flood the three entrances of St. Luke's.

8:44am: The National Police Agency opens an emergency operations unit to coordinate fire, police, and emergency medical system rescue units.

8:50am: The first patient observed at the Ophthalmology Department has very pinpointed pupils, so the St. Luke's staff suspects organophosphate poisoning. Incoming patients are put on intravenous lines. Also, the National Police Agency, suspecting a chemical agent is the cause of the subway chaos, asks the Self Defense Agency to send two chemical warfare experts to assist the emergency operations unit and soon thereafter orders all police and rescuers going into the subway stations to wear gas masks.

8:55am: At St. Luke's, a stat call is issued for all available medical staffers report to the emergency department.

9:00am: Police begin to block access to the affected subway stations, collect and analyze samples and other items at the scene. Television crews start broadcasting live reports of the unfolding disaster.

9:12am: News of Tokyo subway commuters sickened by a mysterious gas hits the international news wire, courtesy of British Reuters news agency.

9:20am: Hospital administrators at St. Luke's declare an emergency, canceling routine operations and outpatient services. The decision is taken to convert non-medical spaces (e.g., halls, chapel) to patient holding and treatment areas.

9:30am: St. Luke's receives a telephone call from Dr. Nobu Yanagisawa of Shinshu University Hospital, one of the physicians who treated the victims of Aum's June 1994 sarin attack in Matsumoto. Yanagisawa, who has seen the television reports, tells St. Luke's he believes that sarin may again be the causative agent.

9:40am: The Tokyo fire department, equipped with gas infrared analyzers but lacking nerve agents in their analytical database, initially identifies the chemical substance as acetonitrile. St. Luke's staff have observed symptoms (e.g., myosis) and have blood test results that contradict this information, so they do not act upon it.

9:45am: The Ministry of Transport and Transportation orders all transportation systems within the country put on the highest level of alert.

10:00am: One doctor and three nurses arrive from the Japanese Self Defense Forces Hospital to provide St. Luke's staff with treatment advice and assist with care of victims. They indicate with a 99 percent probability that sarin was the causative agent, so critical patients are started on intravenous 2-pyridine aldoxime methiodide. *(continued, next page)*

**Box 3.1: Timeline (continued)**

10:10am: Self Defense Forces units at the Chemical School at Omiya are put on alert and dispatched downtown to assist with chemical detection, sample collection, and decontamination.

10:30am: St. Luke's holds a press conference about the emergency and provides the first handout to medical staff about the causative agent, symptoms, and treatment.

11:00am: St. Luke's learns from television news that police using a gas chromatograph-mass spectrometer have identified the agent as sarin. The police did not directly call hospitals with this information. A facsimile arrives from Shinshu University Hospital with data about sarin poisoning and treatment.

11:30am: A second, more detailed treatment protocol is distributed to the St. Luke's medical staff, and patients are given a simplified history questionnaire as well as an instructional handout.

12:00noon: Doctors at St. Luke's standardize triage and treatment for the victims.

12:50pm: A two-person sample collection team from the Omiya Chemical School completes its work at the Kodenmachi station, and the samples travel under police chain of custody back to the laboratory at Omiya for analysis.

2:00pm: St. Luke's sends home 528 patients who have recovered from eye irritation symptoms.

3:07pm: Four chemical agent detection specialists from the Omiya Chemical School arrive, one apiece, in succession at the Tsukiji, Hibiya, Kodenmachi, and Kasumigaseki subway stations. Between 4:20pm and 2:30am on the 21<sup>st</sup>, they employ sensors to detect the presence of chemical agent.

4:50 to 9:20pm: Soldiers from the decontamination units at the Omiya Chemical School arrive at several subway stations to decontaminate the stations and subway trains.

8:00pm: St. Luke's obtains final reconfirmation of the list of patients who were admitted.

12:00midnight: Tokyo fire department obtains a final listing of how many patients have been admitted to which hospitals.

Sources: Note that some sources have military chemical units arriving earlier on the scene, accounts that contradict the internal Self Defense Force memorandum cited in this chronology. Tetsu Okumura, Kouichiro Suzuki, et al., "The Tokyo Subway Sarin Attack: Disaster Management, Part 1: Community Emergency Response," *Academic Emergency Medicine* 5, no. 6 (June 1998): 614–5; Tetsu Okumura, Kouichiro Suzuki, et al., "The Tokyo Subway Sarin Attack: Disaster Management, Part 2: Hospital Response," *Academic Emergency Medicine* 5, no. 6 (June 1998): 619, 620, 622; Tetsu Okumura, Kouichiro Suzuki, et al., "The Tokyo Subway Sarin Attack: Disaster Management, Part 3," *Academic Emergency Medicine* 5, no. 6 (June 1998): 626. David E. Kaplan and Andrew Marshall, *The Cult at the End of the World* (New York: Crown Publishers, Inc., 1996), 251; Dr. Tatsuo Yamaguchi, "Japanese Medical Team Briefing," in *Proceedings of the Seminar of Responding to the Consequences of Chemical and Biological Terrorism*, Office of Emergency Preparedness (Washington, DC: US Public Health Service, Department of Health and Human Services, 11–14 July 1995), page 2–27; Dr. Sadayoshi Obu, "Japanese Medical Team Briefing," in *Proceedings of the Seminar of Responding to the Consequences of Chemical and Biological Terrorism*, Office of Emergency Preparedness (Washington, DC: US Public Health Service, Department of Health and Human Services, 11–14 July 1995), page 2-22; Yukio Matsui, Sadayoshi Obu, Akira Yamashina, "Hospital Deployment in Mass Sarin Poisoning Incident of the Tokyo Subway System: An Experience at St. Luke's International Hospital, Tokyo," *Japan Hospitals*, no. 15 (July 1996): 68–9; Sadayoshi Obu, "Sarin Poisoning in the Tokyo Subway," briefing slides (Tokyo: St. Luke's International Hospital, n.d.); D.W. Brackett, *Holy Terror: Armageddon in Tokyo* (New York: Weatherhill, 1996); 2–5; "Report of the Japanese Ground Self Defense Forces: Chronology of Activities," Internal Memorandum (Tokyo: Japanese Ground Self Defense Forces, n.d.).

appointments.<sup>91</sup> All of the hospital's personnel were pressed into service to treat patients, including psychiatrists, pathologists, and urologists.<sup>92</sup> St. Luke's staff conducted triage at all three hospital entrances. In the press of the disaster, ambulances delivered some casualties without triage tags.<sup>93</sup>

Before the day was over, ambulances transported 688 patients, which means that well over four thousand people reached hospitals by alternate means—on foot and via taxi and private vehicles.<sup>94</sup> Although St. Luke's bore the brunt of the disaster, 278 Tokyo hospitals and clinics saw 5,510 patients, seventeen of whom were deemed critical, thirty-seven severe, and 984 moderately ill. The cases classified as moderate complained only of vision problems (e.g., myosis). Among the deluge of patients were numerous individuals exhibiting some of the same symptoms as those who had been gassed. Roughly 85 percent of those reporting to hospitals in the aftermath of the sarin attack were psychogenic patients, also called the worried well.<sup>95</sup> These psychogenic patients had no real chemical injuries, but they nonetheless clamored for medical attention. Thus, doctors and nurses faced the multiple challenges of distinguishing truly injured from worried well, diagnosing what was causing the mass illness, and deciding upon the appropriate treatment. At St. Luke's, the staff separated incoming patients into 528 mild, 107 moderate, and four severe cases. As appropriate, victims were given intravenous fluids and oxygen. Severe cases were taken to the intensive care unit, moderate cases were admitted to wards, and mild cases were observed.<sup>96</sup>

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<sup>91</sup> Ibid., 620.

<sup>92</sup> Dr. Sadayoshi Obu, "Japanese Medical Team Briefing," in *Proceedings of the Seminar of Responding to the Consequences of Chemical and Biological Terrorism*, page 2-23.

<sup>93</sup> Okumura et al., "The Tokyo Subway Sarin Attack: Part 2," 620; Okumura et al., "The Tokyo Subway Sarin Attack: Part 1," 615.

<sup>94</sup> Okumura et al., "The Tokyo Subway Sarin Attack: Part 1," 615; Obu, "Japanese Medical Team Briefing," 2-22. At St. Luke's, sixty-four arrived by ambulance, thirty-five by mini-van, and the remainder by taxi, private vehicle, or on foot. Dr. Sadayoshi Obu, "Sarin Poisoning in the Tokyo Subway," briefing slides (Tokyo: St. Luke's International Hospital, n.d.).

<sup>95</sup> Of the 5,510 casualties who reported to medical facilities, over 4,470 showed no visceral symptoms of nerve agent exposure. Similarly, one-third of the World War I soldiers who claimed to have been gassed had not in fact been exposed to warfare agents. Chemical warfare came of age during that war, with one-third of the battlefield munitions containing choking, blood, or blister agents. One-third of all of the casualties were indeed caused by poison gas. Sidell, "US Medical Team Briefing," pages 2-32-33. Another study puts the number of worried well in Tokyo at 73.9 percent. See James W. Stokes and Louis W. Banderet, "Psychological Aspects of Chemical Defense and Warfare," *Military Psychology* 9, no. 4: 405-6.

<sup>96</sup> Mild cases were experiencing eye problems alone, moderate cases were nonambulatory and exhibited other symptoms, and severe cases were nonambulatory and on mechanical ventilation. Okumura et al., "The Tokyo Subway Sarin Attack: Part 2," 620. According to another source, there were five severe cases and a total of 641 patients. Dr. Sadayoshi Obu et al., "Sarin Poisoning on Tokyo Subway," *Southern Medical Journal* 90, no. 6 (June 1997): 588-90.

Within a couple of hours, St. Luke's hospital had filled with 640 unexpected patients.<sup>97</sup> Aside from the emergency department and the intensive care unit, patients were treated virtually everywhere—in the chapel, the outpatient department, the halls, and wards. Initially, the St. Luke's staff tried to complete standard medical charts, but soon had to forsake that practice in favor of a continuous sheet recording pertinent data. They improvised a check-box form that listed the state of exposure (e.g., where, when, how), the patient's signs and symptoms, treatment, and outcome.<sup>98</sup> As patients were fanned throughout the hospital, communications inside the hospital became so jammed that it was not possible to call from one department to another. Hospital staff resorted to shouting down the halls or personally hunting down a particular colleague.<sup>99</sup> With virtually all victims complaining of vision problems, the first stop for many was the ophthalmology department, which saw its first patient at 8:50am. Victims had very pinpointed pupils, a sign of organophosphate poisoning.<sup>100</sup>

The St. Luke's staff took blood samples from all patients, and the results began to return at 9:40am, as noted in box 3.1. The blood tests showed very low cholinesterase levels, additional evidence that led the doctors to suspect organophosphate poisoning. About an hour after the first patients arrived, the fire department informed St. Luke's that the source of the problem was acetonitrile, a possibility that clinical findings did not support. Moreover, after consulting in-house medical databases and the Japan Poison Information Center, the doctors at St. Luke's suspected sarin. A critical telephone call from a physician who had attended to the victims of Aum's sarin attack in Matsumoto and medical specialists from the Japanese Self Defense Forces further steered the preliminary diagnosis toward sarin.<sup>101</sup> Once the St. Luke's medical

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<sup>97</sup> Tetsu Okumura et al., "Report on 640 Victims of the Tokyo Subway Sarin Attack," *Annals of Emergency Medicine* 28, no. 2 (August 1996): 130. The number of patients is given elsewhere as 641, including five pregnant women and thirteen children. Yukio Matsui, Sadayoshi Obu, and Akira Yamashina, "Hospital Deployment in Mass Sarin Poisoning Incident of the Tokyo Subway System: An Experience at St. Luke's International Hospital, Tokyo," *Japan Hospitals*, no. 15 (July 1996): 69.

<sup>98</sup> Their revised approach was essentially a stiff medical chart sheet with a neck strap and serial numbers. Okumura et al., "The Tokyo Subway Sarin Attack: Part 2," 620–1, 623; Obu, "Japanese Medical Team Briefing," 2-21–22.

<sup>99</sup> Interview with author: St. Luke's Physician, Tokyo (27 October 1999).

<sup>100</sup> Tatsuo Yamaguchi, "Japanese Medical Team Briefing," in *Proceedings of the Seminar of Responding to the Consequences of Chemical and Biological Terrorism*, page 2-27. Initially, rescuers and doctors suspected that the illness in Matsumoto was caused by food poisoning, contaminated water, or gas. Residents complained of nausea, poor vision, headache, and low-grade fever. Doctors were unable to determine via medical examination that sarin was causing the victims' illness, but could diagnose very strong organophosphate poisoning before sample analysis revealed the presence of sarin. Yanagisawa, "Matsumoto, Japan (June 1994)," page 2-20; Okudera et al., "Unexpected Nerve Gas Exposure in the City of Matsumoto," 528.

<sup>101</sup> The military physician from the Self Defense Forces quickly observed the patients, contacted his supervisors, and then told the St. Luke's staff that sarin was the causative agent. The headquarters then faxed information about sarin and care of those exposed to it. Particularly useful was data on what questions to ask the patients to help determine the severity of their exposure. Interview with author: St. Luke's Physician, Tokyo (27 October 1999). This military assistance arrived so quickly that physicians at St. Luke's surmised that the Self Defense Forces were on heightened alert about a possible attack. Interviews with author: St. Luke's Physicians, Tokyo (27 and 30 October 1999). The patients did not have methemoglobinemia, which would have been consistent with acetonitrile poisoning. The doctors employed the MEDLINE and EMBASE databases. Okumura et al., "The Tokyo Subway Sarin Attack: Part 2," 621; Obu, "Japanese Medical Team Report," 2-22–24; Matsui, Obu, and

staff believed that nerve gas was involved, they started critical patients on a 2-PAM intravenous drip, which stands for 2-pyridine-aldoxime-methiodide. They also directed that admitted patients shower and change clothes. Due to lack of space, they did not decontaminate most of the mildly affected victims.<sup>102</sup> Elsewhere around Tokyo, some hospitals had also admitted patients in the clothes they were wearing and were confronting secondary contamination problems. Some other hospitals required incoming victims to change clothes before admission.<sup>103</sup>

Roughly two and a half hours after the first victim had reached their doorstep, the St. Luke's medical staff learned from television broadcasts—not directly through official channels—that police had identified the poisonous substance as sarin.<sup>104</sup> With the confirmation of sarin exposure, the St. Luke's staff began to administer 2-PAM to severely and moderately ill patients, as appropriate.<sup>105</sup> St. Luke's had 100 ampules of 2-PAM and 1,030 ampules of atropine sulfate on hand, enough to begin initial treatment of the more serious cases.<sup>106</sup> Other hospitals did not have 2-PAM in supply, and it was fortunate that the alert managers of the Osaka company that manufactured the drug rushed emergency supplies to Tokyo as the disaster was unfolding.<sup>107</sup> St. Luke's patients alone were given 700 ampules of 2-PAM and 2,800 ampules of atropine.<sup>108</sup>

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Yamashina, "Hospital Deployment in Mass Sarin Poisoning Incident of the Tokyo Subway System," 68. Only one physician from the Chemical School at Omiya was dispatched to Tokyo, sent first to the National Police Hospital at 1:05pm. This doctor subsequently moved from hospital to hospital in Tokyo, returning to Omiya at 7:00pm. "Report of the Japanese Ground Self Defense Forces: Chronology of Activities," Internal Memorandum (Tokyo: Japanese Ground Self Defense Forces, n.d.). Hence, the military doctors who were helping their civilian counterparts were from the regular military medical corps.

<sup>102</sup> Ambulatory patients showered themselves. The medical staff gave nonambulatory patients bed baths and changed their clothes and linens. Okumura et al., "Report on 640 Victims of the Tokyo Subway Sarin Attack," 132; Okumura et al., "The Tokyo Subway Sarin Attack: Part 2," 620.

<sup>103</sup> F. R. Sidell, "Chemical Agent Terrorism," *Annals of Emergency Medicine* 28, no. 2 (August 1996): 224.

<sup>104</sup> Okumura et al., "Tokyo Subway Sarin Attack: Part 1," 615. Aum Shinrikyo apparently used acetonitrile, which the fire department detected, to help jump-start the evaporation of the sarin. Olson, "Overview: Recent Incident and Responder Implications," page 2-40.

<sup>105</sup> Until they had confirmation of sarin, they did not want to administer 2-PAM because this drug could have worsened the condition of the patients had an agricultural organophosphate been the causative agent. Interview with author: St. Luke's Physician, Tokyo (30 October 1999); Okumura et al., "Report on 640 Victims of the Tokyo Subway Sarin Attack," 132; Obu, "Japanese Medical Team Briefing," page 2-24.

<sup>106</sup> Okumura et al., "The Tokyo Subway Sarin Attack: Part 2," 621.

<sup>107</sup> Officials at the Sumitomo Kagaku Corporation in Osaka learned that something horrible had befallen Tokyo's subway commuters from live television reports. Convinced there was a strong possibility that sarin was the causative agent, they took the initiative to send 2-PAM supplies to Tokyo. The Japanese government neither called nor required this company to do this, but the Sumitomo Kagaku truck may have received a police escort to speed its arrival. Interviews with author: St. Luke's Physicians (27, 29 and 30 October 1999). This account contradicts previous reports that the Japanese government had ordered hospitals to stock extra supplies of atropine and 2-PAM. Obu, "Japanese Medical Team Briefing," pages 2-23, 2-26.

<sup>108</sup> Okumura et al., "The Tokyo Subway Sarin Attack: Part 2," 621.

As the morning progressed, several hospitals called St. Luke's to offer help, asking if they could take some of St. Luke's patients to provide some relief. However, there was no disaster plan or means for inter-hospital transport of patients, and the fire department said their ambulances were unavailable. St. Luke's had no choice but to handle the swell of patients for several hours on its own.<sup>109</sup> By mid-afternoon, the mildly affected victims had recovered their eyesight, and St. Luke's released over 525 from the hospital. A total of 111 patients were admitted for continuing observation and treatment, including twenty-two who remained overnight in the chapel.<sup>110</sup> Late in the afternoon of March 21<sup>st</sup>, eighty of St. Luke's remaining 111 patients were well enough to go home. Within a week, St. Luke's discharged all of its patients from the disaster, except for one who suffered severe anoxic brain damage.<sup>111</sup>

## REPERCUSSIONS FOR TOKYO'S EMERGENCY RESCUERS AND HOSPITAL STAFFS

Field rescuers and hospital staffs who attended to the ailing subway commuters also felt the aftereffects of the sarin attack. Among firefighters and police, secondary contamination was not as extensive as one might have expected, since the first rescuers on the scene, when the agent concentration was highest, were not wearing special protective clothing. Of the 1,364 firefighters who rushed to the various subway stations, 135 reportedly were injured while attending to victims.<sup>112</sup> This number equates to roughly 10 percent of the firefighters, but the injuries were not of a serious nature. At St. Luke's, the medical staff saw a few symptomatic police and a group of about twenty firefighters, who exhibited only mild effects (e.g., eye problems, headache) and were therefore released in the afternoon.<sup>113</sup> Similarly, a total of 135 Tokyo EMTs,

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<sup>109</sup> Interview with author: St. Luke's Physician, Tokyo (30 October 1999); Okumura et al., "The Tokyo Subway Sarin Attack: Part 1," 615.

<sup>110</sup> After six hours of observation, patients with vision problems only were discharged, but those with dyspnea, nausea, vomiting, or numbness were kept for additional observation and treatment. Okumura et al., "The Tokyo Subway Sarin Attack: Part 2," 622; Obu, "Japanese Medical Team Briefing," page 2-22.; Sadayoshi Obu, "Sarin Poisoning in the Tokyo Subway," briefing slides (Tokyo: St. Luke's International Hospital, n.d.). Late in the evening, the staff of St. Luke's was able to reconfirm the list of admitted patients, a feat that the Tokyo fire department was unable to accomplish cumulatively for hospitals throughout the city until 16 hours after the attack. Okumura et al., "The Tokyo Subway Sarin Attack: Part 1," 615. Among the reasons given for the ability of the St. Luke's staff to cope with this huge number of patients were the professionalism of the staff, "the time of the day, the fact that a majority of victims were not very old, and a simple, single injury; no trauma, no bleeding." Obu, "Japanese Medical Team Briefing," page 2-25.

<sup>111</sup> Obu, "Japanese Medical Team Briefing," pages 2-22 and 2-24; Matsui, Obu and Yamashina, "Hospital Deployment in Mass Sarin Poisoning Incident of the Tokyo Subway system," 69.

<sup>112</sup> *Planning Considerations for Health and Medical Services Response to Nuclear/Biological/Chemical Terrorism* (Washington, DC: US Department of Health and Human Services, November 1996), 2. As cited in Jonathan B. Tucker, "National Health and Medical Services Response to Incidents of Chemical and Biological Terrorism," *Journal of the American Medical Association* 278, no. 5 (6 August 1997): 362.

<sup>113</sup> Interview with author: St. Luke's Physician, Tokyo (29 October 1999). No official figures have been released on the number of police injured during the disaster response, but a Japanese official estimated the number to be roughly one hundred, with no serious injuries. Interview with author: Government Official, Japanese Government, Tokyo (27 October 1999).

or about 10 percent of those who responded on March 20<sup>th</sup>, showed exposure symptoms and required medical treatment. The majority of these EMTs became symptomatic while transporting patients, probably because of off-gassing from the victims in the poorly ventilated ambulances. Authorities ordered the windows of ambulances opened which alleviated the problem.<sup>114</sup> The secondary exposure problem in Tokyo was not too grave because no rescuers required antidote treatment. Although the on-scene rescuers after Aum's June 1994 attack in Matsumoto were similarly vulnerable, just over 7 percent of the first responders there became symptomatic, and only one of the affected rescuers sought medical assistance.<sup>115</sup>

Secondary exposure problems also occurred at St. Luke's, particularly in areas of the hospital where air circulation was poor. Of more than 1,060 on-duty staffers surveyed, 110 staff members, all women, described experiencing secondary exposure symptoms. Almost one-half of the personnel working in the poorly ventilated chapel reported symptoms, as opposed to only 16.7 percent of those working in the emergency department, where the wide-open doors helped to circulate air. Only one nurse, who worked the entire day in the chapel, was admitted after exhibiting multiple exposure symptoms. The most frequent complaint of other hospital staffers involved vision problems, but no other St. Luke's staff required medical care.<sup>116</sup> Analogous to the situation at St. Luke's, the staffs at the hospitals in Matsumoto who cared for the victims of Aum's sarin attack there had minimal secondary exposure problems.<sup>117</sup>

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<sup>114</sup> Okumura et al., "The Tokyo Subway Sarin Attack: Part 1," 614-5.

<sup>115</sup> Of the ninety-six Matsumoto rescuers, eight individuals, or 7.6 percent, reported symptoms. Only one, a 45-year-old fireman complaining of headache and nausea, was admitted to the hospital. He was discharged the next afternoon. Seven other Matsumoto rescuers experienced symptoms (e.g., vision problems, nausea, headache), but did not seek medical care. Yanagisawa, "Matsumoto, Japan (June 1994)," 2-17-18; Okudera et al., "Unexpected Nerve Gas Exposure in the City of Matsumoto," 528.

<sup>116</sup> Of the 474 staffers responding to the questionnaire, 66 (14 percent) reported eye symptoms, 52 (11 percent) headaches, 39 (8.3 percent) throat pain, 25 (5.3 percent) dyspnea, 14 (3 percent) nausea, 12 (2.5 percent) dizziness, and 9 (1.9 percent) nose pain. St. Luke's sent the questionnaire to 1,063 hospital doctors, nurses, nurse assistants, volunteers, and clerks and 44 percent responded. Okumura et al., "The Tokyo Subway Sarin Attack: Part 2," 620-1; Obu et al., "Sarin Poisoning on Tokyo Subway." On the minor secondary exposure effects, see also, Obu, "Medical Team Briefing," page 2-24. A key indication of the mild nature of the secondary exposure problem was that not a single health care employee who treated patients required antidote. Interview with author: Medical Toxicologist/Poison Control Center Director (13 June 2000).

<sup>117</sup> Like their Tokyo counterparts, the staffs at the six hospitals in Matsumoto who treated over fifty victims after the June 1994 attack did not have the advantage of protective clothing or respirators. Several hospital personnel and nurses experienced nausea and fatigue and one doctor had myosis. All recovered within a week. Okudera et al., "Unexpected Nerve Gas Exposure in the City of Matsumoto," 528. Concluded one doctor about the effects on the staff at Matsumoto's Shinshu University Hospital, where several nurses experienced dim vision and myosis was confirmed in a few, "the medical staff was not affected by secondary contamination." Yanagisawa, "Matsumoto, Japan (June 1994)," page 2-20.

## THE WAKE OF THE MARCH 20<sup>TH</sup> ATTACK

The death toll on March 20<sup>th</sup> was eight, and it eventually rose to twelve.<sup>118</sup> The aftereffects of Aum's attack were felt by far more than those who were unfortunate enough to be on the subway during the morning rush hour. Prior to this event, Japan had enjoyed a reputation for being one of the safest, least violent countries in the world, a fact in which its citizens rightfully took pride. Aum's attack shook the entire nation in a way that no earthquake ever had.

The maze of rescuers, reporters, regular business traffic, and curiosity seekers paralyzed the city center for hours after Aum's attack. Underground, the three major lines of the subway system, plus over twenty-six subway stations, were closed.<sup>119</sup> Health, safety, and transit authorities in Tokyo moved promptly to restore public confidence in the city's safety. Troops from the Self Defense Force Chemical School in Omiya received orders at 10:10am to help decontaminate the affected subway trains and stations. These units began arriving on scene at 4:50pm and worked in five subway stations, continuing their operations well past midnight.<sup>120</sup> Wearing gas masks and other protective clothing, they swabbed various surfaces with a 5 percent sodium hydroxide solution.<sup>121</sup> Clean-up operations were accomplished rapidly, and by late in the evening transit authorities had most of the subway system back in normal service. With assurances from public officials that the system was clean and safe, commuters took to the subway again in the days that

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<sup>118</sup> Okumura et al., "The Tokyo Subway Sarin Attack: Part 2," 619; Sidell, "US Medical Team Briefing," page 2-32. In the June 1994 Matsumoto incident, seven died. Okudera et al., "Unexpected Nerve Gas Exposure in the City of Matsumoto," 528.

<sup>119</sup> Brackett, *Holy Terror*, 142.

<sup>120</sup> Soldiers from the decontamination units arrived at Hibiya subway station at 4:50pm and began working five minutes later. Most members of this unit left for Tsukiji station, where they engaged in decontamination operations between 5:20 and 6:21pm. A second decontamination unit from Omiya arrived at Korakuen station and conducted decontamination operations between 7:40 and 8:40pm. Both decontamination units met at Kasumigaseki station, which they decontaminated between 9:30 and 9:40pm. Another decontamination team worked at Kodenmacho station between 11:25pm and 1:22am. The two decontamination teams returned to base, respectively at 10:30pm and 2:05am. Working in conjunction with these teams were four chemical detection specialists, the first of whom arrived at Kasumigaseki station at 3:07pm. The other three were dispatched to Hibiya, Kodenmacho, and Tsukiji stations. A two-person sample collection team from Omiya collected samples at Kodenmacho station just before 1:00pm. These samples were sent under police custody to the laboratory at Omiya. "Report of the Japanese Ground Self Defense Forces: Chronology of Activities," Internal Memorandum (Tokyo: Japanese Ground Self Defense Forces, n.d.). In all, roughly sixty troops were dispatched to decontaminate the affected areas. Interviews with author: Major, Japanese Self Defense Force, and Civilian Official, Japanese Self Defense Agency, Tokyo (28 October 1999).

<sup>121</sup> On sodium hydroxide as the decontamination fluid, Tu, "Basic Information on Nerve Gas," 315-6. The speed of the clean-up operation drew criticism from some experts, who thought that the decontamination solution was removed from surfaces before it could take effect. Such solutions should be left on surfaces for at least fifteen to twenty minutes. Sidell, "US Medical Team Briefing," page 2-35.

followed, although ridership was lower than normal.<sup>122</sup> As a precaution against additional foul play, the subway company asked commuters not to leave packages onboard trains or in stations and decided to remove all of the litter containers within the subway system. Years passed before the Tokyo subway system reinstalled the trashcans.<sup>123</sup>

On March 22<sup>nd</sup>, law enforcement authorities at last took action against Aum Shinrikyo. At dawn, 2,500 police and soldiers in partial or full protective gear, some carrying caged canaries, executed raids on the Kamikuishiki compound and two dozen other Aum sites. Cult members were arrested by the score, but Asahara and many of his most senior aides had gone into hiding. In a taped radio broadcast, the guru urged his followers to “meet death without regrets” and persevere with the cult’s plan for “salvation.”<sup>124</sup> After the attack, Asahara also sent a videotaped message to the Japanese media claiming that he and 1,700 of his followers were ill from Q fever.<sup>125</sup>

For the next week, dozens of unsettled Tokyo citizens continued to stream into hospitals complaining of various symptoms, particularly myosis.<sup>126</sup> One month after the attack, small numbers of patients were seeking treatment for psychological symptoms or post-traumatic stress disorder.<sup>127</sup> Victims of the attack randomly surveyed three months afterwards complained of various eye symptoms. Others experienced panic attacks months later, with many afraid to ride the subways.<sup>128</sup>

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<sup>122</sup> Interviews with author: Major, Japanese Self Defense Force, and Civilian Official, Japanese Self Defense Agency, Tokyo (28 October 1999). Brackett, *Holy Terror*, 142.

<sup>123</sup> Interview with author: Lt. Col., Japanese Self Defense Forces, Ground Staff Office, Tokyo (28 October 1999).

<sup>124</sup> Brackett, *Holy Terror*, 144–8; Sayle, “Nerve Gas and the Four Noble Truths,” 70. Right after the attack, cult members also scrambled to hide evidence of wrongdoing. Kaplan and Marshall, *The Cult at the End of the World*, 256–7. On the feverish search of Tokyo police for canaries given their shortage of chemical detectors, Tu, “Aum Shinrikyo’s Chemical and Biological Weapons,” 66. See also, T. R. Reid, “Japan Gathers Evidence on Sect,” *Washington Post*, 23 March 1995; Nicholas D. Kristoff, “Terror in Tokyo: Japan Police Raid the Offices of a Sect Linked to Poison Gas,” *New York Times*, 22 March 1995.

<sup>125</sup> Asahara blamed the United States for dispersing this agent over the compound, as well as sarin and yperite, a World War I-era blister agent. Translated excerpt of this videotape, which was sent on 24 March 1995, was provided by Mr. Masaaki Sugishima (1 September 2000).

<sup>126</sup> Yamaguchi, “Japanese Medical Team Briefing,” page 2-28. St. Luke’s saw an additional 365 patients from the 21<sup>st</sup> to the 28<sup>th</sup>. Matsui, Obu, and Yamashina, “Hospital Deployment in Mass Sarin Poisoning Incident of the Tokyo Subway System,” 69.

<sup>127</sup> Obu, “Japanese Medical Team Briefing,” page 2-24; Yamaguchi, “Japanese Medical Team Briefing,” page 2-29.

<sup>128</sup> Yamaguchi, “Japanese Medical Team Briefing,” page 2-29; Interview with author: St. Luke’s Physician, Tokyo (27 October 1999). St. Luke’s hospital surveyed the 640 patients that it admitted, and the majority of those responding reported experiencing some type of post-traumatic stress disorder one, three, and six months after the attack. Eighty percent returned the questionnaire, and almost 60 percent of the respondents said they also experienced sleep disturbance, flashbacks, depression, shock, nightmares, and irritability. Obu et al., “Sarin Poisoning on Tokyo Subway,” 591. Because the number of patients was so great, the hospitals could not afford on their own to do the proper follow-up tracking on the victims, and the Japanese government did not require or offer fiscal aid to conduct follow up surveys. Interview with author: St. Luke’s Physician, Tokyo

A series of incidents in the train stations of Tokyo and Yokohama in May and June 1995 exacerbated the efforts of Tokyo officials to restore a sense of normalcy. Thrice, chemical devices containing powdered sodium cyanide and diluted sulfuric acid were placed in Tokyo train stations. When mixed, these two chemicals create hydrogen cyanide, and the device found in the Shinjuku station on May 5<sup>th</sup> 1995 contained a sufficient amount to kill thousands of commuters. Watchful subway attendants foiled each of these attacks, apparently attempted by Aum members to retaliate against the Japanese police. By comparison, the two copycat acts in Yokohama were innocuous, involving tear gas, an incapacitating, but not lethal chemical agent.<sup>129</sup>

Throughout the summer of 1995, Japanese police continued to round up Asahara's faithful, eventually arresting over two hundred key members. The guru Asahara was finally located on May 16<sup>th</sup> 1995 and taken into custody from his tiny hiding place in the Satyan 6 building at the Kamikuishiki compound.<sup>130</sup> A core group of seven hundred entranced followers remained unfazed by these events. Fealty and recruitment continued unabated. In 1997, the cult more than doubled its branches in Japan, attracting roughly 2,700 followers. Aum hosted "educational" seminars at a brisk 50-per-month clip, and as before, new members tithed to the organization. Moreover, Aum's computer and other businesses did well, despite the lingering negative publicity of the trials of Asahara and other cult members. In 1999, the cult's estimated net worth was over \$20 million.<sup>131</sup>

By mid-2000, the Japanese court system had prosecuted numerous cult figures. None of the charges brought against those on trial pertained to the cult's biological weapons program. Instead, they were tried for various conventional crimes (e.g., kidnapping, murder) and the acts associated with the subway attack.<sup>132</sup> Seven cult members received death sentences and several others received lengthy jail terms, as shown in table 3.1. Other trials were underway in mid-September 2000, including those of Asahara and Endo. Some members of the cult made public apologies, and in January 2000 Aum Shinrikyo changed its name to Aleph,

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(29 October 1999). A survey by Japan's National Police Association, released in January 1999, stated that 57 percent of 1,247 people who had witnessed the attack "complained that memories of the accident would return suddenly, or they felt frightened whenever they rode a train." "Sarin Attack Victims Seek Healthcare Costs," *Yomiuri Shinbun*, 20 March 1999.

<sup>129</sup> Staff Statement, *Global Proliferation of Weapons of Mass Destruction*, 62, 68–9; Olson, "Overview: Recent Incident and Responder Implications," page 2-39; Brackett, *Holy Terror*, 154–7; Kaplan and Marshall, *The Cult at the End of the World*, 271, 279–80. On the motive for the attempted hydrogen cyanide attacks, personal communication from Dr. Anthony Tu (6 October 2000).

<sup>130</sup> T. R. Reid, "Leader of Japanese Cult Arrested in Subway Attack," *Washington Post*, 16 May 1995; Nicholas D. Kristoff, "Japanese Arrest Cult Leader Blamed in Poison Gas Attacks," *New York Times*, 16 May 1995. Asahara's hiding place measured a coffin-like three feet high by ten feet long. When found, he is said to have ordered police not to touch him because it is considered disrespectful to touch a guru. Brackett, *Holy Terror*, 159–60; Kaplan and Marshall, *The Cult at the End of the World*, 281.

<sup>131</sup> Kaplan, "Aum Shinrikyo (1995)," 289, 305–6; Olson, "Aum Shinrikyo: Once and Future Threat?" 513–6.

<sup>132</sup> Personal communication from Mr. Maasaki Sugishima (4 September 2000).

the first letter of the Hebrew alphabet.<sup>133</sup> Five years after the attack, law enforcement authorities apparently had not seized all of the toxic chemicals that were in Aum's possession, and in March 1998 a member of Aum made a sarin threat against the Moscow subway.<sup>134</sup> Lingering concerns that the cult could resume its harmful activities were in large part responsible for a 1999 law enabling Japanese police to investigate suspicious activities more aggressively.<sup>135</sup>

## **FIVE YEARS AFTER TOKYO: RETHINKING THE LESSONS**

According to official reports, Aum Shinrikyo perpetrated at least ten chemical and nine biological attacks on their Japanese countrymen between 1990 and 1995.<sup>136</sup> By almost any standard, Aum Shinrikyo was a terrorist nightmare—a cult flush with money and technical skills led by a con-man guru with an apocalyptic vision, an obsession with chemical and biological weaponry, and no qualms about killing. This combustible combination left scars on Japan and by proxy on the rest of the world. Aum Shinrikyo, it is fair to say, changed the way the world thinks about terrorism. Now that more is known about the cult's weapons programs and the subsequent rescue operations, it is important to see if the appropriate lessons were taken from Tokyo.

The first lesson that many took from Tokyo was that it presaged a new age of terrorism wherein chemical and biological weapons would be an integral part of the terrorist arsenal. Five years, several major terrorist truck bombings, and numerous other conventional terrorist attacks later, this lesson should be reconsidered from the perspective of terrorists, who will study Aum's attacks with three things in mind. According to one definition of a successful terrorist attack, Aum's subway sarin assault was a resounding

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<sup>133</sup> "Cult in Gas Attack Apologizes, but Japanese are Skeptical," *New York Times*, 2 December 1999; "Japan Doomsday Cult Reorganizing," *Associated Press*, 18 January 2000. Immediately following Aum's name change, some Japanese businesses, schools and organizations that used the word "Aleph" in their titles also switched names after being bombarded with calls from customers and students concerned about connections with the cult. Calvin Sims, "Japan Sect's Name Change Brings Confusion and Fear," *New York Times*, 24 January 2000.

<sup>134</sup> Kaplan, "Aum Shinrikyo (1995)," 307. Also, on 22 April 2000, a notebook containing a sarin "recipe" was seized from a car in which Miwa Matsumoto, Asahara's daughter, was a passenger. Cult representatives claimed that the notebook, belonging to a sect member with a degree in chemistry, was being delivered to a lawyer for use in the defense of one of the Aum members on trial. Mari Yamaguchi, "Police Seize Cult's Newly Written Nerve Gas Recipe," *Associated Press*, 26 May 2000; "Aum Still Pursuing Sarin Studies," *Mainichi Shinbun*, 26 May 2000.

<sup>135</sup> The law, widely acknowledged as having been written with Aum Shinrikyo in mind, gives police broad powers to survey and search, without a search warrant, any organization that has committed "indiscriminate mass murder during the last 10 years." Howard W. French, "Figure in Japanese Cult Freed from Jail, and Mobbed by Press," *New York Times*, 30 December 1999. Using this act's broad powers, police searched several Aum facilities in five prefectures in February 2000. Although the law did not allow police to seize any materials during these searches, they were empowered to require Aum to report details about its facilities, the extent of cult assets, the cult's membership and Internet activities. "New Powers Used to Search Aum Sites," *Mainichi Shinbun*, 5 February 2000.

<sup>136</sup> Kaplan, "Aum Shinrikyo (1995)," 286. Note that the Monterey database, discussed in chapter 2, lists nineteen Aum Shinrikyo attacks, several of which were targeted at the cult's enemies or deserters.

**Table 3.1: Aum Shinrikyo's Crimes and Punishments\***

| <b>Cult Member</b>                           | <b>Crime(s) Prosecuted</b>   | <b>Sentence</b>    |
|--|--|--------------------|
| Dr. Ikuo Hayashi, chief cult physician       | Attacker, 20 March 1995 subway sarin attack  | Life imprisonment  |
| Akira Yamagata                               | Murder using VX  | 20 years in prison |
| Kozo Fujinagawa                              | Builder of Satyan 7 and of a sarin aerosolization device   | 10 years in prison |
| Yoshihiro Inoue, Aum's chief of intelligence | Planning of murders and attacks  | Life in prison     |
| Kitoaki Okazaki                              | Kidnapping, murder of three members of Sakamoto family and of Shuzo Taguchi, a cult member               | Death sentence     |
| Kiyohide Hayakawa                            | Kidnapping, murder of three members of Sakamoto family and of Shuzo Taguchi, a cult member               | Death sentence     |
| Satoru Hashimoto                             | Attacker, 27 June 1994 sarin attack in Matsumoto; kidnapping, murder of three members of Sakamoto family | Death sentence     |
| Masato Yokoyama                              | Attacker, 20 March 1995 subway sarin attack  | Death sentence     |
| Yasuo Hayashi                                | Attacker, 20 March 1995 subway sarin attack  | Death sentence     |
| Toru Toyoda                                  | Attacker, 20 March 1995 subway sarin attack  | Death sentence     |
| Kenichi Hirose                               | Attacker, 20 March 1995 subway sarin attack  | Death sentence     |
| Shigeo Sugimoto                              | Driver, 20 March 1995 subway sarin attack  | Life imprisonment  |

\* Note that the trials of Shoko Asahara and Seichi Endo were still underway in mid-October 2000.

Sources: Hiroshi Matsubara, "Aum Rulings Set Line between Life and Death," *Japan Times*, 11 August 2000; Anthony T. Tu, "Aum Shinrikyo's Chemical and Biological Weapons," *Archives of Toxicology, Kinetics and Xenobiotic Metabolism* 7, no. 3 (Autumn 1999): 79–80.

success. That definition revolves around the amount of publicity that a terrorist operation gains.<sup>137</sup> Few

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<sup>137</sup> Bruce Hoffman, *Inside Terrorism* (New York: Columbia Univ. Press, 1998), 131; Brackett, *Holy Terror*, 6; Jenkins, "Understanding the Link," 50.

would quibble that the cult's attack was one of the most publicized terrorist incidents in history.

Another factor that terrorists will consider is whether Aum's use of chemical and biological weapons helped to achieve the cult's goals. Operationally, Aum's objective on March 20<sup>th</sup> has been identified as killing as many police as possible and thereby forestalling, if not cancel, a police raid on their compounds. In a larger context, the objective was to incite such social upheaval that the mad guru's prophecies about the coming apocalypse would materialize, leading to the collapse of the Japanese government. If anything, the subway attack backfired, increasing the determination of the Japanese police to move on the cult. The raid was delayed only by forty-eight hours. As for the larger goals, the Japanese government remains intact, the Japanese islands are still afloat, and most of the cult's hierarchy is imprisoned, some under death sentences. The cult itself persists, but is a shadow of its former self. In this light, Aum's venture into biological and chemical warfare can hardly be viewed as contributing to the cult's operational or overall objectives. Accordingly, several analysts argue that terrorists will see Aum's sarin attacks less as a beacon than as a warning not to follow suit. Terrorists, they posit, will shun chemical and biological weapons in favor of their familiar, less complicated trade tools—guns and bombs.<sup>138</sup>

A third factor that terrorists will consider, which interrelates to another lesson that many took from Tokyo, is how "easy" chemical and biological weapons are to acquire and use. The lesson that has frequently been derived from the Aum experience is that germ and poison weapons are well within the grasp of terrorists, particularly since most of the requisite components of a weapons program are available in the scientific literature or the commercial marketplace. All that terrorists needed, according to this logic, was a couple of scientists to assemble these components.

One of the hallmarks of Aum Shinrikyo was the unusual emphasis that the cult placed on recruiting scientists and technicians for its weapons programs. Aum's weapons teams had ample resources and years in which to unravel the intricacies of making and disseminating chemical and biological weapons. Yet, from obtaining virulent seed cultures to spreading germs, Aum's bio program a total bust. The cult's chemical weapons program was certainly more mature, but it was also something of a risky business, involving numerous toxic leaks and accidents as well as dissemination attempts that jeopardized the lives of cult members. Thus, terrorists might look at the Aum experience and see successfully acquiring and using these weapons as a hard rather than an easy proposition.

Some have said that Aum's weapons programs did not reach full potency because its scientists were not as good in practice as they were on paper, and the isolated and distorted environment of the cult was not

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<sup>138</sup> Raymond A. Zilinskas, "Aum Shinrikyo's Chemical/Biological Terrorism as a Paradigm?" *Politics and the Life Sciences* 15, no. 2 (September 1996): 238; Jenkins, "Understanding the Link," 48–9.

conducive to good decision making.<sup>139</sup> The size of Aum Shinrikyo's scientific corps was already an aberration for the terrorist world, and many of its scientists had enviable, if not ideal, credentials. If hack scientists were Aum's problem, then this analysis begs the question of whether cults and terrorist groups ever could recruit the top-flight scientific talent needed for a full-scale weapons program. One analyst has pointed out that it may be difficult for other terrorist groups or cults to repeat Aum's feat of recruiting so many university-trained scientists because such groups operate in a manner that is antithetical to the free-thinking academic setting to which scientists are accustomed and in which they thrive.<sup>140</sup> Statements that one or a couple of graduate-level scientists could conquer the technical complexities of inflicting mass casualties with chemical and biowarfare agents are plentiful, but they seem to fly in the face not just of Aum's experience, but of the considerable human resources that governments have had to muster for viable weapons programs.

Other lessons from Tokyo pertain to the accuracy of reporting and the power of numbers. The indelible image of that horrible day is of subway exits littered with prone commuters, their noses bloodied, gasping for air. The injury toll for March 20<sup>th</sup> is still most often given as "over 5,500."<sup>141</sup> The power of that number and the fearsome reputation of chemical weapons has combined to make Aum's subway attack seem more damaging than it was. On its true scale, the attack was bad enough—fifty-four critically and severely injured. Over 980 others suffered mild exposure symptoms, such as eye problems and headache, but the remainder of the 5,500 were worried well. The human consequences of the Tokyo subway attack should not be diminished, but nor should the direct effects of the attack be blown out of proportion: The number 5,500 is a one hundred-fold amplification of the serious and critical injuries. The death toll from that day—twelve—is a fraction of the dead from bombings of the US Marine barracks in Lebanon (241), Pan Am flight 103 (260), the federal building in Oklahoma City (168), and the US embassies in Nairobi, Kenya and Dar es Salaam, Tanzania (257).

Although it may not seem that way at first glance, some things were working in favor of commuters who happened to be in the wrong place at the wrong time on March 20<sup>th</sup> 1995. From analysis of agent, it is known that the sect used a low-grade sarin during the Tokyo attack. The low concentration of the sarin has been attributed to both orders from Murai to weaken the agent strength after the Matsumoto attack and to

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<sup>139</sup> Falkenrath, Newman, and Thayer, *America's Achilles' Heel*, 22–4.

<sup>140</sup> Jonathan B. Tucker, "Measures to Fight Chemical/Biological Terrorism: How Little is Enough?" *Politics and the Life Sciences* 15, no. 2 (September 1996): 244.

<sup>141</sup> In an October 1995 publication, "Improving the Security of Russia's Chemical Weapons Stockpile," the author also cited the figure of "over 5,000" from press accounts in the *New York Times* and the *Washington Post*. She has lost track of the times she has encountered the figure since, and it is only through interviews and the medical literature that she has come to appreciate these important distinctions.

its last-minute manufacture.<sup>142</sup> The effectiveness of the attack was certainly not aided by the decidedly low-tech method of delivery—umbrella-poking of plastic bags filled with sarin. Most commuters scattered through the resulting vapor hazard to the station exits, where fresh air diluted the mist even more. Comparatively few people received a lethal dose under these conditions. Those who died apparently had direct contact with liquid agent, and those who were most seriously injured were standing or sitting right next to the packages from which the toxic fog originated.<sup>143</sup> Consequently, the vast majority of the victims were mildly affected.<sup>144</sup>

A second category of inflated statistics has arisen concerning the number and severity of injuries among the rescuers and hospital personnel. To hear some tell it, virtually all of the police, firefighters, and ambulance crews became victims themselves, and the hospitals staffs were decimated by the effects of off-gassing. The lesson that was extrapolated from this version of events is that maximum protective gear and total decontamination should be the iron-clad rules of responding to an unconventional terrorist attack, lest rescuers and health care providers be seriously injured themselves. In field jargon, this viewpoint is articulated as “level A all the way,” referring to the highest level of protective gear available.

The actual statistics of secondary contamination among Tokyo rescuers and hospital care providers tell a somewhat different story. Rescuers converged on the scene with no protective gear, and they did not decontaminate victims. Yet, an average of 90 percent of the firefighters, police, EMTs, and health care providers were unscathed.<sup>145</sup> The large majority of the 10 percent with secondary exposure problems had mild symptoms (e.g., eye problems, headache) and continued to perform their duties. One staffer at St.

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<sup>142</sup> The concentration of agent in the samples averaged 25 percent pure sarin. Perhaps the most authoritative source on the methods that the cult may have used to synthesize the sarin is a US chemist that aided Japanese police in their sample analysis. Tu, “Basic Information on Nerve Gas,” 311–2; Tu, “Chemistry and Toxicology of Nerve Gas Incidents in Japan in 1994 and 1995,” 89–92. Others disagree about what formula Aum employed to produce sarin but concur that the Tokyo attack was executed with a weak sarin. Aum may have used a manufacturing process of 1950s vintage, the German salt process. According to one analyst, the sarin was apparently not distilled, so concentrations averaged 25 percent but ranged from 10 to 40 percent. Olson, “Overview: Recent Incident and Responder Implications,” page 2-40. According to Kaplan and Marshall, Aum used a Russian manufacturing technique. *The Cult at the End of the World*, 108. On orders to weaken the sarin and the last-minute manufacture, Brackett, *Holy Terror*, 39, 117–8, 125.

<sup>143</sup> Among those with direct contact with the agent were subway station attendants who tried to remove the bags of sarin and clean up the liquid agent. Casualties were also highest at the stations that were most poorly ventilated. Brackett, *Holy Terror*, 138–41; Olson, “Overview: Recent Incident and Responder Implications,” page 2-41. Note that decontamination would have been much more critical to the safety of the responders and the survival of the victims if they had been exposed to liquid agent. Sidell, “US Medical Team Briefing,” page 2-34.

<sup>144</sup> Interview with author: St. Luke’s Physician, Tokyo (29 October 1999). Obu et al. “Sarin Poisoning on Tokyo Subway,” 592.

<sup>145</sup> The injury statistics are discussed on page 95. One chemical weapons expert concluded that “cross-contamination of medical personnel was minimal or nonexistent.” Sidell, “Chemical Agent Terrorism,” 224. On the mild secondary contamination problems because of diluted agent, interview with author: St. Luke’s Physician, Tokyo (29 October 1999). On secondary exposure because of lack of protective gear and decontamination of victims, Okumura et al., “The Tokyo Subway Sarin Attack: Part 1,” 614–5.

Luke's, which by far received the most patients and therefore arguably faced the most serious secondary contamination risk, required hospitalization. Therefore, those who attended the injured that day in the field and at the hospital of course advocate protective gear for EMTs and hospital workers, but rather than the maximum protective gear, they recommend that level C or better suits and respiratory protection be stipulated for hospital workers.<sup>146</sup> The latter approach is much more workable in the hospital setting.

Had Aum Shinrikyo used military-grade sarin and a more effective dissemination method, the injury to commuters, rescue teams, and hospital personnel undoubtedly would have been much higher. However, the worst-case scenario is not always what unfolds. Given the technical production and dispersal difficulties that Aum, with all of its resources and scientific skill, could not overcome, the cult's experience could lead one to question the feasibility of terrorists achieving the worst-case scenarios that apply to the use of chemical and biological weapons by well-trained military forces. Therefore, one response lesson from Tokyo is that rescuers and health care providers should evaluate each crisis on its own merits, thereafter taking protective and decontamination precautions appropriate to the circumstances.<sup>147</sup>

Other lessons can be learned from the post-attack response. Tokyo emergency crews cleared critical and serious patients from the incident scene to the hospitals within a couple of hours. What brought the Tokyo hospital system under such pressure was not the truly injured, which hospitals proved more than capable of handling, but the monsoon of psychogenic patients. The first lesson here relates to the importance of getting clear and concise information to those at the scene as well as throughout a stricken city to reduce the anxiety that might cause otherwise healthy people to go to hospitals. The other lesson is that rescue teams that are not local will be of practically no lifesaving utility unless they are pre-deployed.<sup>148</sup> As the saying goes, all emergencies are local.

Another aspect of the Tokyo response has to do with human nature: In a crisis, everyone wants to be a hero. Independent of any request from professional rescuers, personnel from federal ministries inserted

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<sup>146</sup> The authors do not stipulate a level of protection for field medical personnel, but do specify respiratory protection, chemical resistant suits, gloves, and boots, which could be consistent with level C, B, or A gear. Given the tenor of the article, the authors did not intend to recommend level A protective gear for EMTs. Okumura et al., "Tokyo Subway Sarin Attack: Part 1," 617; Okumura et al., "Tokyo Subway Sarin Attack: Part 2," 622–3. On levels of personal protective clothing, see Chris Hawley, *Hazardous Materials Response & Operations* (Albany, NY: Delmar, Thomson Learning, 2000), 108–11. Also, Robert D. Cox, "Decontamination and Management of Hazardous Materials Exposure Victims in the Emergency Department," *Annals of Emergency Medicine* 23, no. 4 (April 1994): 761–70.

<sup>147</sup> Commenting on the lessons of Tokyo for protective gear, a veteran first responder said that a mandatory Level A protective gear rule is not the answer and that on certain occasions firefighting bunker gear with splash and respirator protection would suffice. Interview with author: Police Lieutenant (23 March 1999). This viewpoint has since received Pentagon approval, as noted in chapters 5 and 6. On the matter of decontamination, Tokyo's lesson was: "This business of decontamination. . . sometimes is overdone." Sidell, "US Medical Team Briefing," page 2-34.

<sup>148</sup> Note that the various units of the Omiya Chemical School, which is located on the outskirts of Tokyo, were unable to reach the scene for roughly five hours.

themselves into rescue operations at the incident scene and within the health care system. Many of these officials had little or no experience in disaster response, but nonetheless insisted on throwing around their weight. Emergency response professionals, who had asked for help from the Self Defense Forces' Chemical School, did not know these other newcomers. These circumstances created command and control confusion, making the Tokyo response more complicated, less coordinated, and less effective.<sup>149</sup> To avoid adding to the tumult of the disaster scene, the response should be directed by experienced professionals who attend to local emergencies on a daily basis, know local circumstances and capabilities, and can maintain clear lines of command and control. The lesson that resonates from this experience is that other organizations and assets should participate only at the request on the on-scene command authority and the receiving hospitals.

Contributing in no small part to difficulties with command and control was an inability to communicate. A seemingly mundane matter that many take for granted in the age of cell phones and the Internet, clear communications are essential to the effectiveness of any disaster response. Within responding agencies and hospitals, between on-scene responders and hospitals, and all around Tokyo, communications were a mess. Regular response frequencies were overwhelmed, as were telephone lines.<sup>150</sup> Rescuers and health care providers received critical information through the media, not through official channels. Since few reporters are trained in the technical intricacies of chemical and biological substances, the media can overlook and distort important information. Getting accurate and timely information to first responders and health care providers is crucial to their personal safety and to their ability to provide appropriate care for victims. Therefore, a priority Tokyo lesson to be learned concerns the need for real-time, multi-directional communications capabilities that connect field agencies with hospitals, the public health department, and laboratories.<sup>151</sup> This lesson, if learned, could pay off significantly in the local response to any type of disaster.

Another aspect of communications has less to do with the radios, cell phones, facsimiles, and the Internet than with the individuals that these tools connect. A terrorist attack with chemical agents was so novel that the specialists that rescuers and hospitals needed to consult right away were not hooked into Japan's emergency response system. The lesson that Tokyo officials and physicians took away from this experience was the importance of pre-planning and the need to identify and link beforehand the range of experts that certain situations might demand. For chemical emergencies, for example, the expertise of

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<sup>149</sup> Interviews with author: Japanese Official, Tokyo (27 October 1999); Major, Japanese Self Defense Forces, Tokyo (28 October 1999); St. Luke's Physicians, Tokyo (29 October 1999); Physician, Ministry of Health Official, Japanese Government, Tokyo (1 November 1999).

<sup>150</sup> Interviews with author: St. Luke's Physician, Tokyo (29 October 1999); Physician, Ministry of Health Official, Japanese Government, Tokyo (1 November 1999). Okumura et al., "Tokyo Subway Sarin Attack: Part 1," 616-7.

<sup>151</sup> Okumura et al., "The Tokyo Subway Sarin Attack: Part 2," 623.

toxicologists and warfare agent specialists from poison control centers and the Omiya Chemical School needed to be fused into a crisis response at the earliest possible moment, even if not in person.<sup>152</sup>

With regard to another preparatory activity that can be undertaken to smooth the way for an effective response, the subway attack clearly caught Tokyo's EMTs and hospital personnel off-guard. The majority of the medical professionals were unfamiliar with chemical casualty care and could have benefitted greatly not only from prior instruction, but from medical treatment protocols to guide their actions. With chemical casualties, lifesaving intervention must occur within moments of exposure to increase chances of survival, so the ready availability of the appropriate antidotes was also underscored.<sup>153</sup> Many hospitals in Japan and in America do not stock these drugs at all or in sufficient quantities to attend to a few, much less a mass of, casualties.<sup>154</sup>

One of the oft-cited lessons of Tokyo is that Japanese intelligence and law enforcement authorities were inattentive or not properly trained to pick up signs of the menace in their midst. The incident has also been listed as a US intelligence failure.<sup>155</sup> Certainly, if intelligence and law enforcement agencies had been watching close enough, they would have detected signs of something amiss, for Asahara's crew publicly spoke of chemical agents and it was certainly possible to connect the dots between the cult's fascination with poison gas, increasingly nefarious acts, and the Matsumoto dress rehearsal. Police in different areas of Japan suspected the cult in several crimes and had concrete evidence of the sect's production of sarin four months prior to the March 20<sup>th</sup> attack, but did not share information with each other. Moreover, Japanese law impeded aggressive investigation and a crackdown on the cult. Religious organizations in Japan were shielded from undue government interference, and no laws were on the books banning the production or possession of chemical or biological agents.<sup>156</sup>

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<sup>152</sup> Okumura et al., "The Tokyo Subway Sarin Attack: Part 1," 617. In the aftermath of Aum's subway attack, the Japanese government has created a roster of experts. Interviews with author: Physician, Japanese Ministry of Health, Tokyo (1 November 1999); Federal Government Official, Japanese Government, Tokyo (27 October 1999).

<sup>153</sup> Okumura et al., "The Tokyo Subway Sarin Attack: Part 1," 617; Sidell, "US Medical Team Briefing," page 2-24.

<sup>154</sup> Interview with author: St. Luke's Physician, Tokyo (29 October 1999). One US city surveyed its hospitals prior to a major international gathering and found enough atropine between them to treat sixty people. Interview with author: Physician/Associate Director, Hospital Department of Emergency Medicine (9 March 1999).

<sup>155</sup> Falkenrath, Newman, and Thayer, *America's Achilles' Heel*, 22. US intelligence officials testified that they had no reason to be concerned about Aum prior to 20 March 1995, despite the cult's public chatter about poison gas and its threats and accusations against the United States. US Congress, Senate Committee on Governmental Affairs, Permanent Subcommittee on Investigations, *Global Proliferation of Weapons of Mass Destruction*, 31 October and 1 November 1995 (Washington, DC: US Government Printing Office, 1996), 273-4.

<sup>156</sup> The Japanese Diet passed a law banning super-toxic, warfare chemicals in April 1995. Brackett, *Holy Terror*, 52, 155, 176, 178-9.

Long before Aum Shinrikyo came along, intelligence and law enforcement authorities should have been on alert for signs of terrorist interest in chemical and biological substances, but another lesson might be in the offing from this total lapse on the part of intelligence and law enforcement authorities. Governments worldwide need to closely re-examine national laws regulating the domestic possession, production, and transfer of toxic substances and biological agents. To preempt and punish any wayward groups or individuals that attempt to procure and disperse such materials, police need the proper legal framework to enable investigation, arrest, and prosecution.