

Towards a Chemical War in Syria ?

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Ethic Communities: Why most of the information and news are inaccurate

By Joseph Lerner

Disclaimer: *This analysis is neither intended to seek solutions for the existing complexes nor to find what party is responsible for the existence of such complexes in society, but merely to describe and present a clear picture of what the existing complexes in society are. Therefore, any conclusion that is other than what is addressed in this specific and isolated analysis by any individual is based on their own merit and discretion. It is highly recommended that those who might not be able to look at the issues from impartial, academic and clinical perspective to avoid reading this analysis about the ethnic communities in Canada. Readers' discretion is advised. What is being read in this analysis is the result of two decades of observation of various ethnic communities to develop some level of insight so that it could be articulate and shared.*

When it comes to ethnic communities, immigration and living in Diaspora most of the information, but not all, or what is called Human Intelligence is inaccurate and hardly could be relied on. The following are some of the reasons:

When people immigrate to a new country, regardless of being wealthy or not, or educated or not, they switch to self-preservation and survival mode. Those immigrants, who are poor and have no financial support, usually in most cases switch to physical self-preservation and survival mode, meaning providing food and shelter for themselves and their family members.

The second classification of new immigrants is those who are highly educated and wealthy when arriving to a new country. Please note education could be formal and informal and having life experiences, but hardly means having a degree or diploma within the specific and isolated context of this analysis. This educated and wealthy classification of immigrants similar to the former switch to cultural-survival and cultural-self-preservation mode, meaning that they have lost their status and access that they had in their home country and, here and now, they are in a totally new land. For this reason, the latter classification members switch to cultural-survival and cultural-self-preservation mode, so that they could regain the same status and find similar access and network to that of what they had when they were back in their home country.

What is addressed in the above, present the following challenges for the immigrants, especially in the ethnic communities that include the Eastern European and Balkans countries that are usually incorrectly are included in the Western European classification of countries:

i) The first group of immigrants/refugees who come with little money, especially those who are highly educated, when they switch to survival and self-preservation mode, they might tend to do things that are against their values and pride, meaning working low paying blue-color jobs that nobody else would want to do. There are medical doctors, those with engineering degrees and highly educated professionals who are qualified to do what they have been trained for, but don't have the money to support their family, so that they could take time off work, study and get their Canadian credentials. These individuals most of the times end up driving taxis, trucks, and work minimum wages jobs. There are some individuals in such classifications who have a hard time adjusting and handling the pressure, then end up being on welfare, suffer from chronic illnesses, end up working cash jobs, and some suffer from depressions due to consistently thinking about their past successful-life without accepting the realities and circumstances of their lives in present time.

All these complexes contribute to this classification of immigrants rather become highly individualistic, competitive and sometimes develop adversarial-competitive-behavior in the ethnic communities. For these reasons, most of the time the individualism wins over collaborative spirit, team work and working towards success through accumulative knowledge amongst the members of this classification of the ethnic communities. This is when each individual tries to prove they are better than the other ones. Some them even go that far and buy a house on mortgage with little down payment, then get a second



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mortgage but a luxury care, while sometimes working minimum wage overtime without being with their families to just look good and present good optics Many families break-apart usually based on unnecessary economic pressures that could have been prevented.

ii) The second group of immigrants are those who are wealthy and educated, and used to be well-known, had prestigious status and were well-connected in their home country back in the old days. When the members of this classification of ethnic communities enter a new society they realize that they could live in trendy areas, purchase the high-end luxury cars and make investments; however, they are hardly influential or could be considered as the movers and shakers of society similar to that of what they were back in their home country. Most of these individuals learn the language well, and due to being sharp and astute business people become well-established. Some even become highly successful developers, patents owners and manufactures. However, the extent of their influence doesn't go beyond influencing the city hall decisions in zoning or getting certain limited Ministry directives in their favor through paying top dollars to lobbyists locally, provincially and federally. Paying to have influence is hardly influence. It costs the members of this classification of immigrants' lots of money to have influence. This class of successful professional immigrants and highly successful business people, who were highly influential back in their home country, realize that they are limited and hardly could have a similar status that they had back in their home country, no matter how much they try or how successful they are going to be, regardless of how many millions of dollars they accumulate. Realization of their limits, by the members of this classification, usually is expressed in not helping the other members of their own community. When people don't help the others, it is usually because they feel that their limits could be known and exposed. This is usually because these individuals know that they have not much room to grow more than what they have achieved. They have reached the cap/limit. This is usually one of the most common root causes of this highly successful classification of the immigrants' insecurity and inability to assist the other members of their community to excel and succeed like them.

iii) The third classification are: amongst these highly educated, wealthy and highly successful immigrants new citizens there are extremely talented individuals with acute sense of knowing how to capitalize on their resources through learning and networking. They are the ones who break the barriers and become influential and movers and shakers of society, however, at one point they too face a break-wall that they no longer could progress. These highly gifted individuals realize that regardless of how much power, wealth and political influence they could have they cannot and will not be able to have root-level cultural influence, influence curriculum of the Canadian education system, decide that what repertoire regularly National Ballet of Canada, Toronto Symphony Orchestra and Montreal Symphony Orchestra its better to play, or what paintings, sculptors and artifacts are going to be displayed at highly regarded and well-known Canadian museum. Once again spending money to have influence is not influences. These highly gifted individuals realize that regardless of how much donations they funnel into these cultural and educational institutions of Canada they could not have any influence on root-level /foundation-level basis. These highly gifted individuals realize that the founding fathers and guardians of this nation have made and make sure that the blueprints, foundation, and landmarks of Canada remain and will always remain exactly as they have been intended to be.

These highly gifted immigrants and new Canadian citizens realize that only improvements are to be done respecting the blueprints, foundation, landmarks and structure upon which this country has come to exist. When these highly educated and gifted new Canadian citizens realize all this, it is then that they have reality check that back in their home country too they were NOT able to have such cultural and educational influences on root-level basis. This is because they were neither the founding fathers nor the guardians of their own culture but merely existed, defined and lived happy within jurisdictions of their culture in their home back in those days. Amongst these groups of individuals there are two classifications: a) those who accept these realities assimilate and resonate with this nation's foundation, landmarks and structure cohesively and harmoniously; and b) those who cannot adjust, adapt themselves and accept these realities. The latter are those who become bitter, and develop jealousy and resentment due to their own either inferiority or superiority complexes and internal-identity-crisis.

Most people in the world are image-driven/image-oriented and focus on optics rather than being true to themselves. If otherwise, then why there are such concepts of *Relational Aggregation* and existence of cliques at schools throughout the world during the adolescence; or the continuum of



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the same social-complexes in adulthood that are expressed through ad hominem and ad hominem fallacy attacks, misleading and coercion, as well as excommunication in society? All these problems occur because people try to seek external validation rather than internal-validation and being happy with who they are inside.

The self-confidence of most people, but not all, depends on the external validations they receive rather than reflecting on their own internal thoughts, insight and actions that are regulated by their own conscience and humility. Thinking is one of the most difficult and energy consuming things in life, and often not a pleasant thing to do at all. Truth sometimes revealed through such processes of critical thinking and analysis often could be a bitter reality. Those who hardly think and articulate their thoughts are usually those who don't have the endurance, stamina, and psychological tolerance to intellectually, critically and clinically internalize each thought, while being impartial, and then analyze each single thought to better understand each single issue. This is always a very difficult process. Otherwise, everyone would go through the trouble and make the effort to articulate his/her thoughts and findings that are the result of such processes.

However, it is also imperative to realize that although thinking is an extremely energy consuming and difficult thing to do, but making time and space to critically think and analyze the events are rewarding and liberating, since they always help the individual to better understand what the fine lines are. However, it is imperative to be realistic and understand that no matter how much one tries one is not perfect, and sometimes, the fine lines only become visible when they are crossed. The key to success in such endeavors is to learn from the errors and move on.

I would like to acknowledge that there are individuals in any community and society who are exceptions and possess exceptional characters. However, being an average person myself, my intention and goal is to analyze the issues that relate to general public rather than the exceptional individuals. This analysis is to address the complexes that the members of the society in general, especially immigrant and new Canadian citizens, experience in their daily lives.

The members of all classifications mentioned in the above, due to being image/optics driven spend most of their time, energy and money in their lives to "appear" as being successful, usually more than what they really are. Members of the ethnic communities usually have the tenancy to over exaggerate when presenting themselves. For example, if they are a course director/professor, they might even present themselves as head of the department or Dean of the university, especially when they go back home. This is one of the other reasons, amongst many, that why the successful individuals in the ethnic communities tend to avoid helping the other members of their own communities. Furthermore, sometimes if they could, they even put road-blocks on the lesser successful members of the ethnic community so that they wouldn't succeed. It is almost similar to that of alpha-male and territorial characteristics without understanding that Canada is **NOT** their territory. This is with the exception of when the members of the ethnic community are facing a common adversary. It is under such circumstances, existence of a common adversary, that they really begin to level with each other and communicate, rally behind the flag and unite.

It is very rare to witness collaboration amongst the members of such communities. It is hardly detected that they pull each other up, invest in the other members of their communities and through team work and accumulative knowledge they succeed. The charity functions and fundraising galas that the members of the ethnic communities come wearing the latest fashion and networking. Such events and charitable fundraising galas are very important and valid but not what this analysis is about.

This analysis is about mutual professional endeavors through extending an olive branch to the lesser fortunate members of their ethnic community to help them to succeed as well. What is being specifically addressed here is mutual professional, business and financial endeavors so that they could generate the funds, so that such charitable endeavors consistently, continuously and flawlessly benefit from. Furthermore, it is common that when these highly successful immigrants and new Canadian citizens do assist someone, then there is always some kind of a string attached but very rarely unconditional. The unusual social phenomenon within the context of ethnic communities is that they don't express their expectation right in the beginning before helping the individual, but rather first appear to be highly altruistic and charitable when they are assisting their fellow ethnic community members.

That is hardly called helping the members of the community in good faith and having a good will.

With no strings attached such kind doing people a favor conditionally is rather similar to that of a social contract or logrolling than anything else in good-faith.



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All these elements and realities contribute to having lack of real and impartial information about what is truly going on in various ethnic communities throughout Canada. There are people who are first generation Canadians from the ethnic communities and grow up in Canada, but they also don't provide the proper information and insight about their communities. This is because these individuals know that if they sincerely and genuinely provide the proper information and bring to light that what really the complexes of their communities are, then such complexes are going to be addressed, the cause for their existence are going to be clinically identified, then the proper solutions for them are going to be found. Then there are not going to be such complexes. When this happens then these first generation Canadians who play the role of the middle-powers in the ethnic communities are no longer going to be needed for their services as they were in the past. For these reasons, as well as lack of multidisciplinary education these individuals don't have a diverse range of transferable skills that are highly valuable and needed, so that they could capitalize on them and be gainfully reemployed outside the jurisdiction of their ethnic communities' networks.

When any individual only has one expertise, one well-established position and jurisdiction that he/she could generate income from, relies on one community or group, or has friends and network only in one community, then his/her lifestyle and survival always depends on only that one expertise, jurisdiction, community, group and network. In such cases since being the middle-power between the ethnic communities and authorities is what the financial and psychological stability of such individuals individual depends on, then such individuals naturally are going to stall and play both the Canadian authorities and the ethnic community members to ensure the continuity of their gainful employment, secure their photo-up opportunities and flawless flow of income. The first order of business to always undoubtedly consider is to make certain that when recruiting such middle-power brokers from various ethnic communities, in the future, then it is imperative to ensure that such middle-power brokers have other highly valuable transferable skills, so that they could options to be gainfully employed outside their own ethnic communities. Most of the information coming from the common members of the ethnic communities, the masses, are usually gossip based. It always tales a tail about the overall mode of the ethnic communities but hardly have the nature that could be helpful in development of solutions. The common members of the ethnic communities usually talk behind each others' back either because they had an arguments in the past, have opposing viewpoints, different egos are at work and in conflict, somebody dated with someone else's friend and had a bad break up, their children got into nasty arguments, they did not get along when they were younger, or are jealous of each others' success. There is also inferiority or superiority complexes that could be commonly detected in the ethnic communities members that influence and create misinformation.

All of these nuances and complexes also exist in non-ethnic communities, especially in small towns throughout Canada and everywhere else one goes on planet earth. However, since second, third and fourth generation Canadians either speak English and French, are well-establish, and they resonate with the norms of the national culture of Canada which there is clearly one, then there exists some the proper cultural baselines so that the irregularities could be easily detected. This is how what is real and impartial information and what is exaggerated information, that its "messenger" might have lesser than sincere and genuine motivations and intentions, could be detected through such baselines and proper modes of reasoning. None of these motives and intentions could properly be identified to such a degree in the ethnic communities, because there are hardly any proper baselines developed for each ethnic community and their various complexes layers and nuances, when it comes to analyzing the raw data and information that are received by the Canadian authorities through Human Intelligence. The Canadian government and authorities could come up with proper solutions and facilitate, to address the ethnic communities needs accordingly, only when there are such baselines for each ethnic community that is highly multilayer and multidimensional.

These are some of the complexes that make it challenging to have a fluid Human Intelligence apparatus when it comes to the ethnic communities. One of the most challenging parts is when it comes to how to clinically and systematically analyze and prioritize the overwhelming information and raw data coming out of the ethnic communities.

The natural tendency of human being is harmony and peace. I categorically disagree with Thomas Hobbes' and Montesquieu's definitions of human nature as being warlike and seeking expansion of territory through violence. This is given the fact that I respect both philosophers. However, what



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they were describing was the nature of the psychopaths who were killing each other and destroying the cities and towns during the religious wars in 17th century Europe, but not a harmonious and peaceful human nature that is aligned with nature and natural laws.

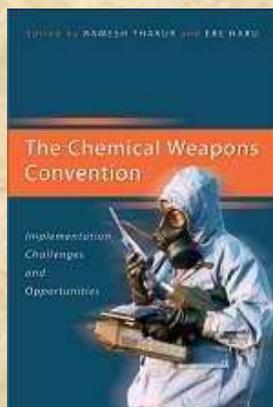
It is based on such premises as "harmonious and peaceful human nature" that I have hope and optimism that at one point the Canadian newcomers, immigrants and new Canadian citizens could experience enlightenment and joy through realizing that they are part of this nation and valuable members of Canadian society, without the need for them to try too hard to prove something so that they could be accepted by the others. People need to realize that this country is great, and spacious enough, for all Canadians to live in harmony.

Canada and Canadian culture by default gives everyone an equal opportunity to grow and fulfill their dreams without any need for the existence of multiculturalism as piece of legislation. This notion is valid if the new commoners, immigrants and new citizens sincerely and genuinely want to seek such an equal opportunity. They need to avoid trying to unrealistically compare themselves to some old money billionaire Canadian family members and come up with this shtick of rich and poor, haves and have not. The reality is that back in their home country they also didn't have the same equal opportunity if they wanted to compare themselves with the rich and famous. What makes people think that they have come to Canada, a new country, and this is going to change overnight? It would help if people rationally and pragmatically think, analyze and assess their situation, advantages and disadvantages.

Human beings naturally have been given an equal intellect and intelligence at birth to create more fair opportunities for themselves. I hardly believe in such a concept as people having different intellects and intelligence level, either being high or low. One could be intelligent at something but not so sharp at something else. Who is to decide? The doors to human mind and intellect could be unlocked, so that one could explore the endless possibilities through critical and progressive thinking, if one has the will-power, motivation, intention and determination to follow through and achieve such intellectual elevation. It takes lot of constant and consistent hard work to do so and achieve such objectives.

Each Canadian be it if he/she is first, second or third generation, immigrant, newcomer or new citizen clearly is aware of the fact that we have a diverse society, and each come from somewhere else, or their ancestors were immigrants. This is the key to our resiliency as a nation. Natural Rights and Natural Laws when are acknowledged on the record and embedded in the constitution of any nation, then they fully cover all that each citizen needs to succeed and progress in life."





Elimination of Chemical Weapons – Accomplishments thus far

By Colonel (ret'd) H R Naidu Gade

The Chemical Weapons Convention (CWC) on the “Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction” was signed in January 1993 at Paris. The Convention Entered in to Force (EIF) on 29 April 1997. The Convention is unique in nature as it provides for a stringent verification regime, provisions for challenge inspections in case of non compliance concerns and investigations of alleged use of chemical weapons (CW). The Organization for Prohibition of Chemical Weapons (OPCW) in The Netherlands (The



Hague) is responsible for the effective implementation of CWC.

Key components of CWC

Demilitarization of CW

The most important obligation under the Convention is the destruction of all chemical weapons. This CW includes CW Agents, filled and Unfilled chemical munitions, Old and Abandoned Chemical Weapons.

The Destruction of CW is the most expensive and time consuming aspect of the implementation of the Convention. Most of the destruction costs are generated by the investment in state-of-the-art technology to ensure that the risk to people and to the environment is kept to a minimum at every stage in the transportation and destruction of munitions, as well as during the removal and destruction of chemical agents. Destruction, therefore, has to be carried out at highly specialized facilities.

Non Proliferation of Toxic Chemicals and their Precursors

Each State Party shall adopt the necessary measures to ensure that toxic chemicals and their precursors are only developed, produced, otherwise acquired, retained, transferred or used within its territory or in any other place under its jurisdiction or control for purposes not prohibited under this Convention.

Assistance and Protection against CW

Every State Party to the CWC has the right to request assistance from the OPCW in any of the following circumstances: a) the State Party considers chemical weapons to have been used against it; b) the State Party considers riot control agents to have been used against it as a method of warfare; or c) the State Party considers itself to be threatened by actions prohibited by the Convention taken by another country.

The Convention explicitly states that all States Parties have the right to conduct research into, develop, produce, acquire, transfer and use means of protection against chemical weapons.

International Cooperation

Commitment to work together for the promotion of peaceful application and use of chemistry for the purpose of economic and technological development of countries involved.

Universality

Goal that all countries in the world become parties to the CWC. Adherence to the CWC demonstrates a state's commitment to disarmament and international co-operation, and helps to reinforce its position in the mainstream of international politics.



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National Implementation Measures

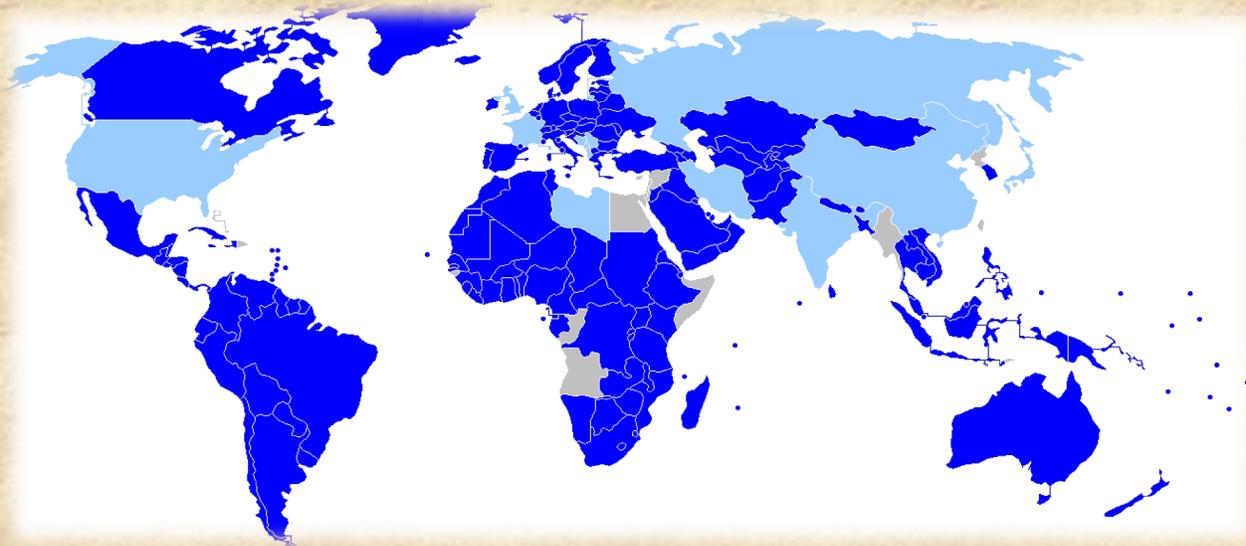
The States Parties to meet their obligations under Article VII of the Convention. This includes establishing National Authorities for effective liaison with the OPCW; taking the necessary steps to enact legislation, including penal legislation and to adopt administrative measures to implement the Convention; identifying declarable chemical-industry and trade activities and submitting accurate declarations.

Status of implementation of CWC

Participation in CWC

As of 01 October 2012 the number of countries (States Parties) participating in CWC:

- Number of State parties – 188 or 98% of global population;
- Number of signatory states that had not yet ratified the Convention – 2 (Israel and Myanmar);
- Number of States that had neither signed nor acceded to the Convention – 6 (Egypt, DPR Korea, Syria, Somalia, South Sudan and Angola).



Submission of Declarations

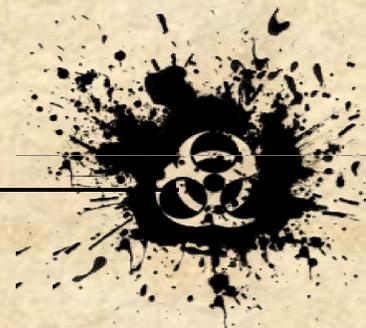
Total of 180 of the 188 States Parties had submitted initial declarations to the OPCW. Eight States Parties (Albania, India, Iraq, the Libyan Arab Jamahiriya, A State Party, the Russian Federation and the United States of America) had between them declared as chemical weapons 71,316 metric tons (MTs) of chemical-warfare agents and precursors, as well as 8,679,150 munitions and containers. In total, 5,599 industrial facilities and plant sites in 80 States Parties were declared in connection with the chemical-industry verification regime.

Verifications CW

Hundred percent of the declared chemical weapons stockpiles have been inventoried and verified. From the time of Entry into Force (EIF) of the CWC (29 April 1997) until 31 Aug 2012, the OPCW has conducted 4,779 verification inspections on the territory of 81 States Parties, including 2,576 inspections of chemical weapon-related sites. 211 chemical weapon-related sites have been inspected out of a total of 227 declared

CWA Destroyed

A Total of 53,661, or 75.37%, of the world's declared stockpile of 71,196 metric tons of chemical warfare agents have been verifiably destroyed. A Total 3.95, or 45.56%, of the 8.67 million chemical munitions and containers covered by the CWC have been verifiably destroyed.



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Albania, India and a State Party have completed destruction of their CW. Iraq is yet to commence destruction of their declared CW. A destruction deadline has yet to be established for Iraq, which acceded to the Convention in 2009.

As at 31 August 2012, the OPCW had verified the destruction by

- The United States of America of 24,923.671 MTs, or 89.75%, of the total amount of Category 1 chemical weapons declared by this State Party;
- The Russian Federation of 26,630.914 MTs, or 66.63%, of the total amount of Category 1 chemical weapons declared by this State Party;
- Libya of 13.476 MTs, or 51.15%, of the total amount of Category 1 chemical weapons this State Party has declared.

Declared and Destroyed/Converted CWPFFs

One hundred percent of the declared Chemical Weapons Production Facilities (CWPFFs) have been inactivated. All are subject to a verification regime of unprecedented stringency. 64 of the 70 CWPFFs declared to the OPCW have been either destroyed (43) or converted for peaceful purposes (21). A total of 438 inspections were carried out on all the declared CWPFFs.

Thirteen States Parties have declared CWPFFs: Bosnia and Herzegovina, China, France, India, the Islamic Republic of Iran, Iraq, Japan, the Libyan Arab Jamahiriya, the Russian Federation, Serbia, the United Kingdom of Great Britain and Northern Ireland, the United States of America, and another State Party.

Declared and Verified Chemical Weapons Storage Facilities (CWSFs)

Total of 460 inspections were carried out of 37 CWSFs belonging to 8 States parties.

Declared CWDFs (Operational & Under Construction)

Thirty Nine Chemical Weapons Destruction Facilities (CWDFs) belonging to 6 States parties were involved in the destruction of chemical weapons stockpiles. A total of 1499 continuous monitoring inspections were carried out at these facilities.

Declared and Destroyed ACWs/OCWs

From the time of EIF of the Convention, 108 inspections of 49 Old Chemical Weapons (OCW) sites in 15 state parties and 71 inspections of 34 Abandoned Chemical Weapons (ACW) sites in 3 state parties were inspected.

Fifteen States Parties had declared a total of 60,398 OCWs produced before 1925 and 71,822 OCWs produced between 1925 and 1946. About 20,000 pre-1925 OCWs and 18,000 OCWs produced between 1925 and 1946 are yet to be destroyed. Around 12,573 chemical weapons abandoned by Japan on the territory of China were being kept at storage sites in China.

Declaration of Riot Control Agents

179 States Parties that had submitted initial declarations under Article III, 176 States Parties submitted information on riot control agents (RCAs), while the information on RCAs was missing from three States Parties' declarations. Of the 176 States Parties that provided information on their RCAs, 130 declared possession of RCAs, while 46 States Parties declared that they did not possess RCAs.

Declared and Inspectable Schedule Chemicals Facilities

From the time of EIF of the convention, the OPCW has conducted 2203 inspections of industrial sites of a total of 5559 sites declared. Worldwide 5305 industrial facilities are liable to inspection.

- Schedule 1 Chemicals – 27 declared facilities;
- Schedule 2 Chemicals – 455 declared facilities;
- Schedule 3 Chemicals – 433 declared facilities;
- DOC/PSF Chemicals – 4390 declared facilities.



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Challenge Inspections

No challenge inspections were requested since EIF of the Convention. It only reflects on the confidence of the member states on the implementation & verification regime of the CWC.

Investigations of Alleged Use of CW

No requests received from States Parties for investigations of alleged use (IAU) since EIF of the Convention.

Assistance and Protection

The OPCW Technical Secretariat organizes courses aimed at providing training to first responders, government experts and emergency response units in building and developing national and regional capabilities and emergency response systems against the use, or threat of use, of chemical weapons. Over 2,200 participants have benefitted from these courses.

Seventy six States Parties have pledged assistance under paragraph 7 of Article X. One hundred twenty nine States Parties have provided information on national programs related to protective purposes under paragraph 4 of Article X. Forty three States have contributed to the Voluntary Fund for Assistance .

International Cooperation

From the time of EIF of the CWC, the International Cooperation programs had 3,502 beneficiaries, including 315 analytical chemists, 265 Associate Program participants, 1,966 Conference Support participants, 115 interns, 239 conferences, 92 laboratories, 437 research projects, and 73 transfers of used and functional equipment.

National Implementation Mechanisms

Total of 186 of the 188 States Parties have designated or established their National Authorities. 141 States parties have submitted information on their legislative and administrative measures in accordance with Article VII of CWC. 89 States Parties have legislation covering all key areas.

Since 1997, nearly 3,000 participants, including more than 1,500 sponsored participants from all geographical regions have received support in the CWC's effective national implementation through OPCW meetings, workshops and training courses.

Conclusion

The success of the First International Disarmament Treaty (CWC) is reflected in the fact that within 15 yrs of Entry In to Force, more than 75% of the worlds CW stockpile has been destroyed under strict international supervision. All the CWPFs were either inactivated/destroyed or converted for peaceful purposes. Effective measures have been put in place to prevent proliferation of toxic chemicals around the globe. No requests for Challenge Inspection or Alleged Use of CW have been received by the OPCW till date.

Colonel (Retd.) H R Naidu Gade is Chief Consultant, CBRNe Secure India. Also a Former Member of International Civil Service and Chief CW Inspector, OPCW.



Aum Shinrikyo Biological and Chemical Weapons Programs Further Revealed by Death Row Inmate, Dr. Tomomasa Nakagawa

By Dr. Anthony T. Tu

All together I have met with Dr. Nakagawa at the Tokyo Detention Center in Kosuge, Tokyo three times, December 14 2011, June 11 2012 and October 16 2012. In each interview I obtained valuable information. The information I acquired in the first two meetings was published in the ASA Newsletter, issue number 144, March 31 2012 and in the CBRNE Terrorism Newsletter in October 2012. In this article I will summarize our conversation during our third meeting held on October 16 2012.

Biological Weapons Program

According to Dr. Nakagawa, Aum initially emphasized BW more than CW. After realizing that the BW program would be a complete failure, they switched to a CW program. I asked Dr. Nakagawa whether they seriously considered the Ebola virus as a potential weapon for their BW program. Dr. Nakagawa answered, "Ebola virus is a hemorrhagic disease that is highly infectious and moreover with its high mortality rate, naturally it is a good candidate for BW." However, Aum did not have the Ebola virus nor the know-how on how to cultivate it. But the Aum sent a member to Kinghasa, Congo to look into the possibility. They were not that serious about it, but they would start an Ebola virus program if they could obtain the culture easily. They found out it was not easy to get the virus, even in the Congo because the virus is in monkeys.

Dr. Nakagawa said they seriously considered two BW agents. One is botulinum toxin and the other is anthrax toxin. The Aum's BW program was administered by Dr. Seiichi Endo. The cult leader, Asahara, had great confidence and trust in Dr. Endo and told him to start growing both botulinum and anthrax bacteria. Asahara did not know anything about the biological agents so it was Dr. Endo that gave Asahara the idea of making botulinum and anthrax. Asahara was quite excited and thought he could wipe out a large portion of Tokyo's population. He organized a seminar on Ishigaki Island in Okinawa; people thought he would teach his disciples about the teachings of Aum and the coming Armageddon. But now we know the reason was to evacuate the cult members so that they would not be exposed to the botulinum and die. Aum actually sprayed the botulinum solution at several places in Tokyo, but nothing happened. I asked Dr. Nakagawa, if the failure was due to the fact that the culture was grown in aerobic conditions, when it should have been grown in anaerobic conditions? Dr. Nakagawa replied, "we know it had to be in anaerobic conditions. The main reason for the failure was due to the lack of proper knowledge of growing botulinum bacteria. It is hard to grow, even for an expert." I also asked where Endo got his botulinum bacteria from. He said Endo got the sample from Okujiri Island, Hokkaido, botulinum bacteria from Hokkaido's soil always contains spores.

The next bio agent the Aum produced was a large amount of anthrax (Fig 1).



Fig 1. Cross Section of Anthrax Spore. For BW the anthrax spore is used and not the anthrax bacteria itself. Because the spore is surrounded by membranes, it is stable. This photo was reproduced with the permission of Dr. Akiko Umeda published in the book, "Photographic Story of Bacteriology." Ed by Kazunobu Amako, Myushu University Printing Office, 1998.

Anthrax is a bacteria originally found in the soil. There are many strains of anthrax but only three strains are relatively well studied; they are the Ames, Vollum, and Sterne strains. The Sterne strain is nontoxic; therefore it is frequently used for vaccine production. The Sterne strain lacks a protective capsule so it is destroyed by macrophages when it enters the human body. In the US there is a general belief that Endo used a non-virulent strain by



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“mistake.” Dr. Nakagawa said that this is not entirely true. He said Endo knew his anthrax was nontoxic, but he had confidence that he could “convert it to a virulent strain through genetic engineering.” But it was a complete failure. Dr. Nakagawa said Endo simply did not know anything about bacteriology. He graduated from Obihiro Veterinary School, so he knew the danger of anthrax poisoning. For further advanced studies Endo got his MS degree from the Virus Institute of Kyoto University. Both anthrax and botulinum are bacteria, not viruses. Endo simply did not have an adequate background or knowledge of bacteriology. His cultivated anthrax was amply proven to be ineffective when Aum sprayed the anthrax solution in the Kamedo district in Tokyo. The residents complained of a foul odor but nobody was hurt.

Aum's Chemical Weapons Program

Because of the BW projects failure, Asahara lost confidence in Endo. Asahara consulted with Mr. Murai, the second high ranking cult member to Asahara. Mr. Murai introduced Asahara to Masami Tsuchiya who had an MS degree in chemistry from Tsukuba University. Tsuchiya recommended the use of sarin as a chemical weapon to Mr. Murai and Asahara in January 1993. Tsuchiya was a brilliant chemist and anything that he made was successful. After the failure of the BW program, Tsuchiya's activities were accelerated and he made not only VX, but he also synthesized many other poisonous gases for the group. He synthesized 20g soman, 20g tabun, 20g GF, 2L of hydrogen cyanide, 2L of phosgene, 200g of VX, 6-7L of sarin including solvent and 200kg of mustard gas. Immediately after the Yomiuri Daily reported that Japanese Police had found methylphosphonic acid from the soil around the 7th Satyan, Aum Shinrikyo was on alert. They started destroying all the chemical weapons that they had produced. But they had too much sarin and could not destroy it all in 3 days. They hid the sarin until they used it in the Tokyo Subway attacked on March 20 1995.

On September 19 1994 the Japanese Police asked me how to analyze methylphosphonic acid after they read an article I had published in “Chemistry Today.” In this article I mentioned sarin could be detected from its degradation products in the soil. The Japanese Police were looking in the air for sarin's precursor, but it quickly evaporates in the air and they could not find anything to be analyzed and identified. After I received the request from Ms. Noriko Tsunoda, who worked at the Research Institute of Police Science, I contacted the US Army for detailed analytical methods of sarin degradation products in soil. The next day, September 20 1994, I received 30 pages of analytical

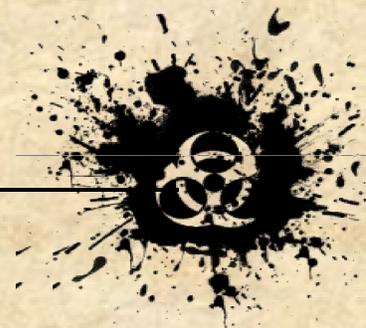


methods of sarin degradation products monoisopropylmethyl phosphonate and methylphosphonic acid. Later the Japanese Police sent me an email acknowledging the receipt of the analytical method of sarin degradation products and they said the materials I had sent them were extremely useful.

Fig 2. Tokyo Detention Center in Kosuge, Tokyo. The author stands at the gate. The sign indicates “To Meeting Office, Tokyo Detention Center.” The photo was taken on October 16 2012.

Yomiuri Shinbun published that the Japanese Police found

organophosphate from the soil in Kamikuishiki; this detailed story was already mentioned in detail in the October 2012 issue of the CBRNE – Terrorism Newsletter. In this article I mentioned where the methylphosphonic acid came from. The finding of methylphosphonic acid by the Japanese Police led to the eventual collapse of Aum Shinrikyo. Dr. Nakagawa said they stopped making sarin at the large facility of the 7th Satyan once they heard the report. This question is very



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important, so I asked Dr. Nakagawa about it once more in our 3rd meeting on October 16, 2012 (Fig. 2). In order to really understand this problem, one needs to know about the 7th Satyan first.

The 7th Satyan

The 7th Satyan is a huge building where Aum planned to manufacture 70 tons of sarin. The steps were automated and the reactions were made by the automatic control panel in each room.

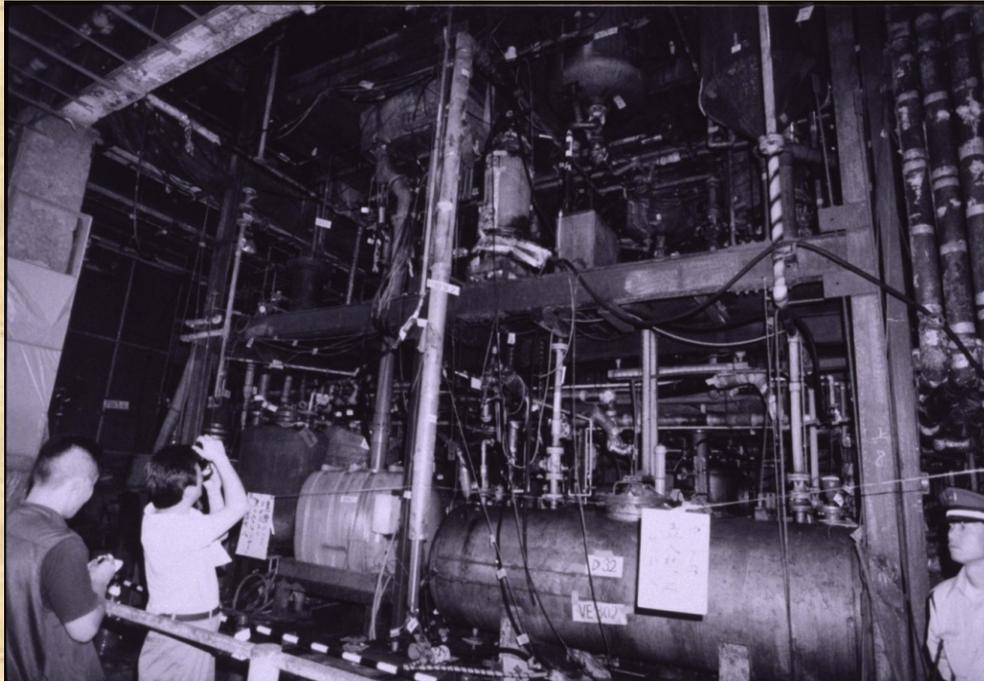


Fig 3. Sarin manufacturing facility in the 7th Satyan, Courtesy of Kyodotsushin.

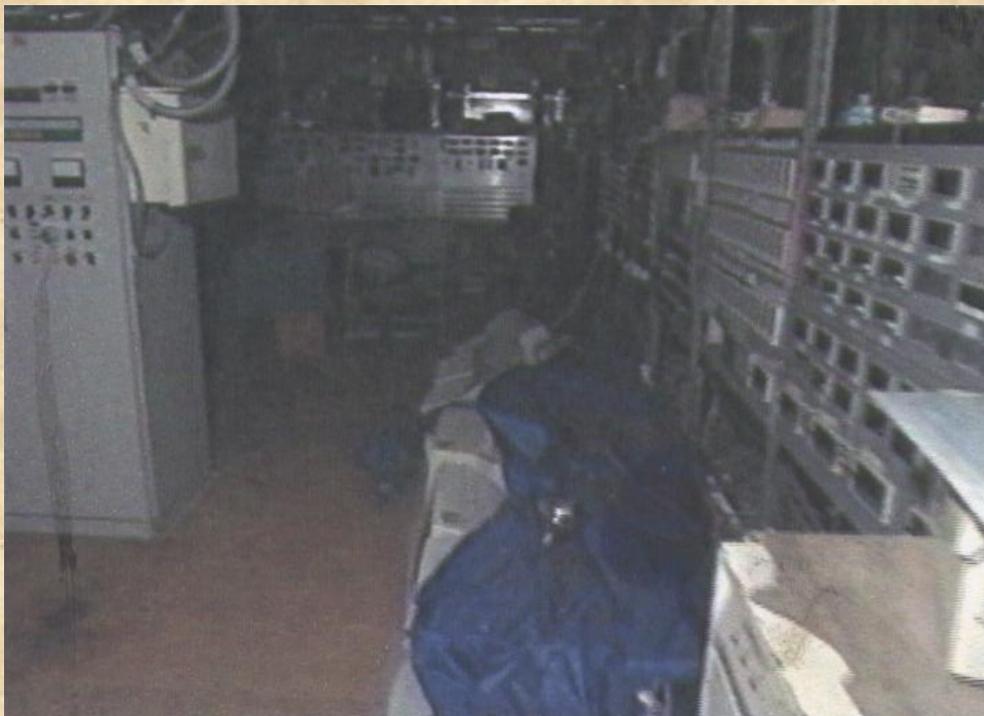


Fig 4. Control panel of sarin synthesis at the 7th Satyan. Courtesy of Mr. Kota Kinoshita of Nippon Television Network Corporation. The photograph is a screenshot from a documentary movie the network made.



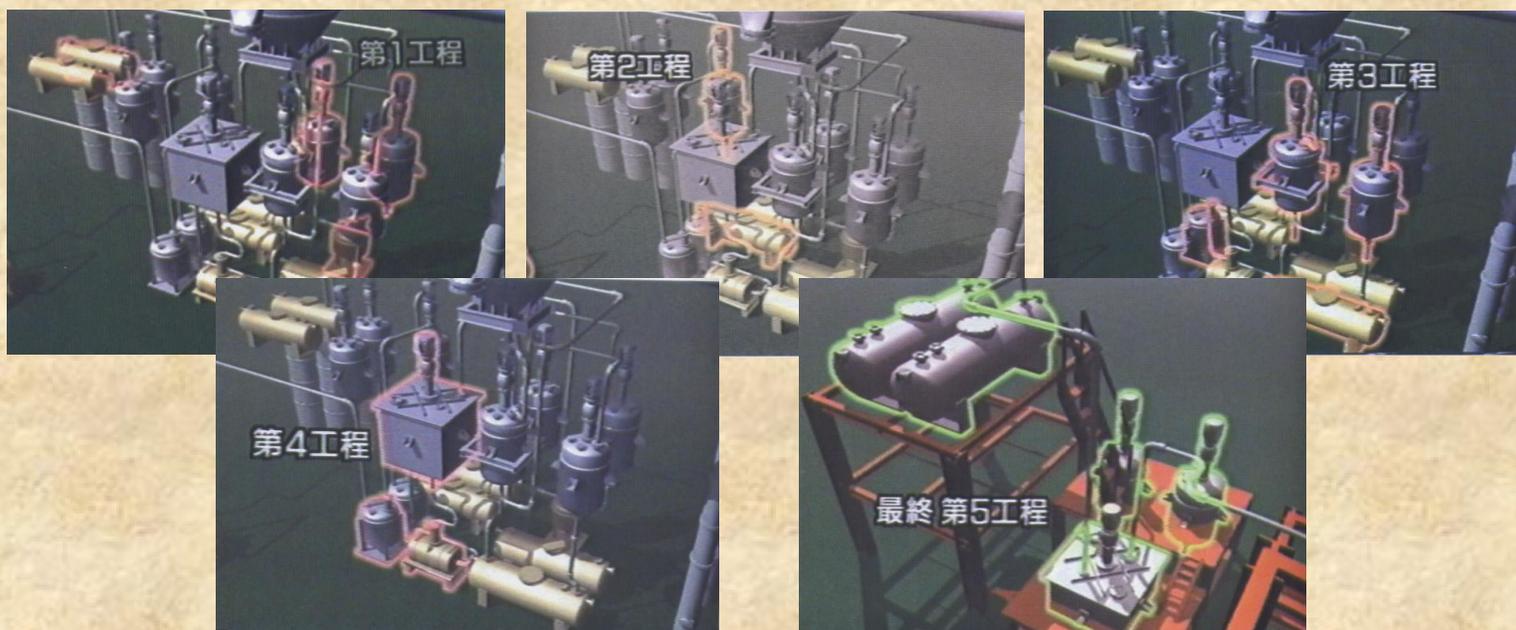


Fig 5. Animated figures of the five step production process of sarin at the 7th Satyan. Courtesy of Nippon Television Network Corporation.

After Asahara realized the prospects of BW, supervised by Endo, had a slim chance of becoming part of the Aum's arsenal he consulted with Hideo Murai. Murai recommended Tsuchiya for the development of the CW program (Fig 6).



Fig 6. Three sarin manufacturing sites at Kamikuishiki.
 Left: Jivaka prefab where the sarin used for the Tokyo Subway attack on March 20 1995 was made.
 Middle: Kushiti Galva prefab (Tsuchiya's lab). The sarin made here was used for the Matsumoto City attack on June 26 1995. The photo was taken by the author on July 19 1995.



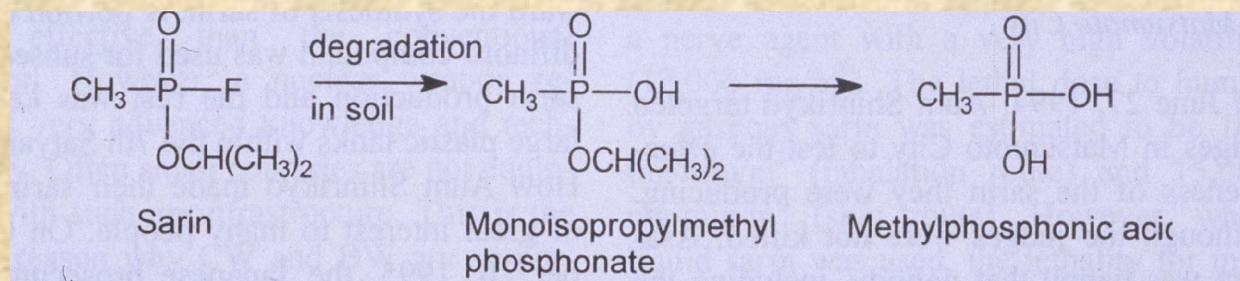
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Tsuchiya met with Ashara in January 1993 and recommended various poisonous gases that they could use. Tsuchiya was given a prefab building called Kushitigalva to make sarin with a bench scale. Dr. Nakagawa called this prefab Tsuchiya's lab. At the same time Asahara ordered Mr. Kiyohida Hayakawa to construct the 7th Satyan in September 1993 for large scale sarin production, with 70 tons as the target quantity.

Methylphosphonic Acid (MPA) in the Soil

Methylphosphonic acid is the stable degradation product of sarin. In November 1994 there was a leak from the 7th Satyan and the Japanese Police identified methylphosphonic acid in the soil (Fig 6). With this compound, Japanese Police concluded that Aum Shinrikyo was making sarin thus they established scientific evidence of sarin production. As to the origin of methylphosphonic acid, I wanted to ascertain the accuracy of the information that Dr. Nakagawa had given me during our second interview on June 11 2012, I asked him about this subject once more in the 3rd interview. Since sarin production at the 7th Satyan was stopped at the 3rd step, the methylphosphonic acid must have come from Tsuchiya's lab. Tsuchiya's prefab actually produced sarin and the surrounding soil must have been heavily contaminated with sarin and its precursors. These compounds would be converted to methylphosphonic acid in the soil. Tsuchiya's lab was right next to the 7th Satyan.

Fig 7. Sarin degradation product, methylphosphonic acid, was detected from the soil of Kamikuishiki.



Dr. Nakagawa told me during our 3rd meeting that they tried only once at the 4th stage facility, on a small scale. But due to the failure of the cooling system, they could not recover the 4th stage reaction product, so difluoromethylphosphonate escaped from the 7th Satyan.

I think the MPA found in the soil came from:

1. Sarin contaminated in the soil that leaked from Tsuchiya's lab
2. Dimethylmethylphosphonate at the second stage reaction and dichloromethylphosphonate at the third stage reaction facility and difluoromethylphosphonate at the fourth stage reaction at the 7th Satyan eventually was converted to MPA.

Detection of Reaction Products Inside the 7th Satyan

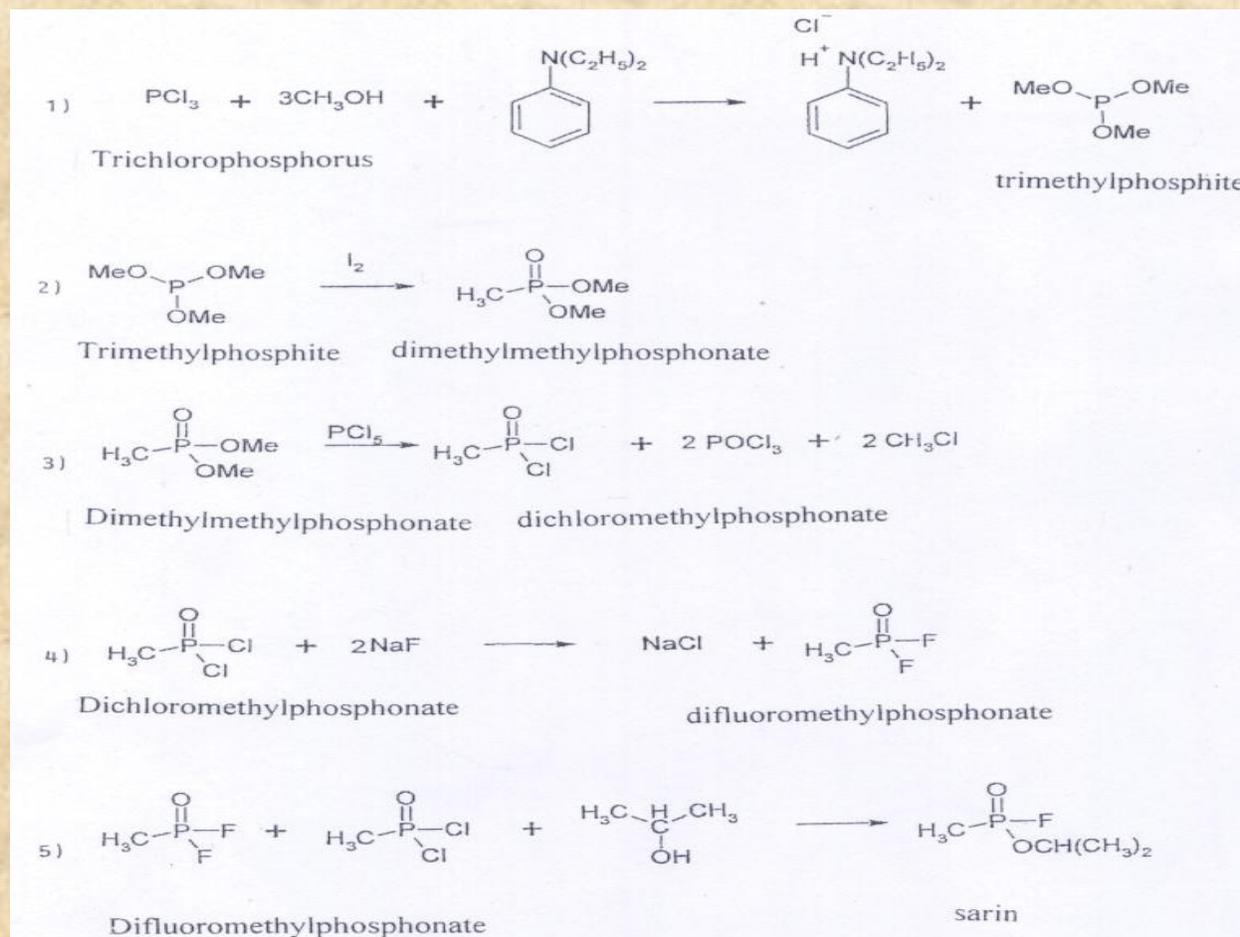
In the previous section (C) I discussed the possible origin of MPA in the soil from Kamikuishiki. In the present section (E) I would like to focus on the reaction at the 7th Satyan building itself. Dr. Nakagawa told me that Aum Shinrikyo stopped the large scale synthesis of sarin at the 3rd step facility at the 7th Satyan. However, he told me that they tried a small scale production only once at the 4th stage facility. Therefore no sarin was produced at the 7th Satyan. However, the Japanese Police published the analysis of each stage at the 7th Satyan in their publication in the ACS Symposium Series 745 (2000) p 332 and again in the OPCW report of the United Nations, June 2001. In the paper the Japanese Police stated, "From the wiped samples taken from the first-step equipment, trimethylphosphate, n-hexane, and DEA were detected. From the second-step equipment, trimethylphosphate, DMMP, iodine and DEA were detected. From the fourth-step equipment, MPA, DEA, sodium chloride and sodium fluoride were detected. From the final-step equipment, IMPA, MPA, DEA, DMMP and sodium chloride were detected. From the chemical analysis of evidence samples taken



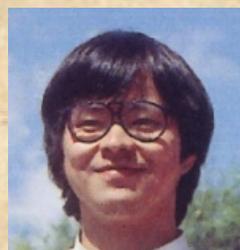
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from the manufacturing plant, only stable substances corresponding to the synthetic routes have been identified, but these serve to verify the synthesis of Sarin in the Aum plant facility (Fig. 8)."

Fig 8. The five steps of sarin synthesis by Aum Shinrikyo. For the Matsumoto City attack sarin was made from the 2nd step. For the Tokyo subway attack, the sarin was made from the 5th step. At the 7th Satyan, the large scale synthesis of sarin was stopped at the 3rd step.



In order to clarify the points that the Japanese Police detected the products, byproducts and precursors at the 4th and 5th stage facility at the 7th Satyan, I visited Dr. Nakagawa once more for a third time on October 16 2012. I asked him what explanation he might have for these reports. He said large scale production at the 7th Satyan was stopped at the third stage. However, they tested the reaction once at the 4th stage facility in November 1994. But they never used the 5th stage facility. The Japanese Police's report at the 4th stage might be explained by the fact that the cult used the 4th stage on a very small scale. But the report on the 5th stage production cannot be explained. This is a big mystery as to the sarin production at the 7th Satyan.



Acknowledgement

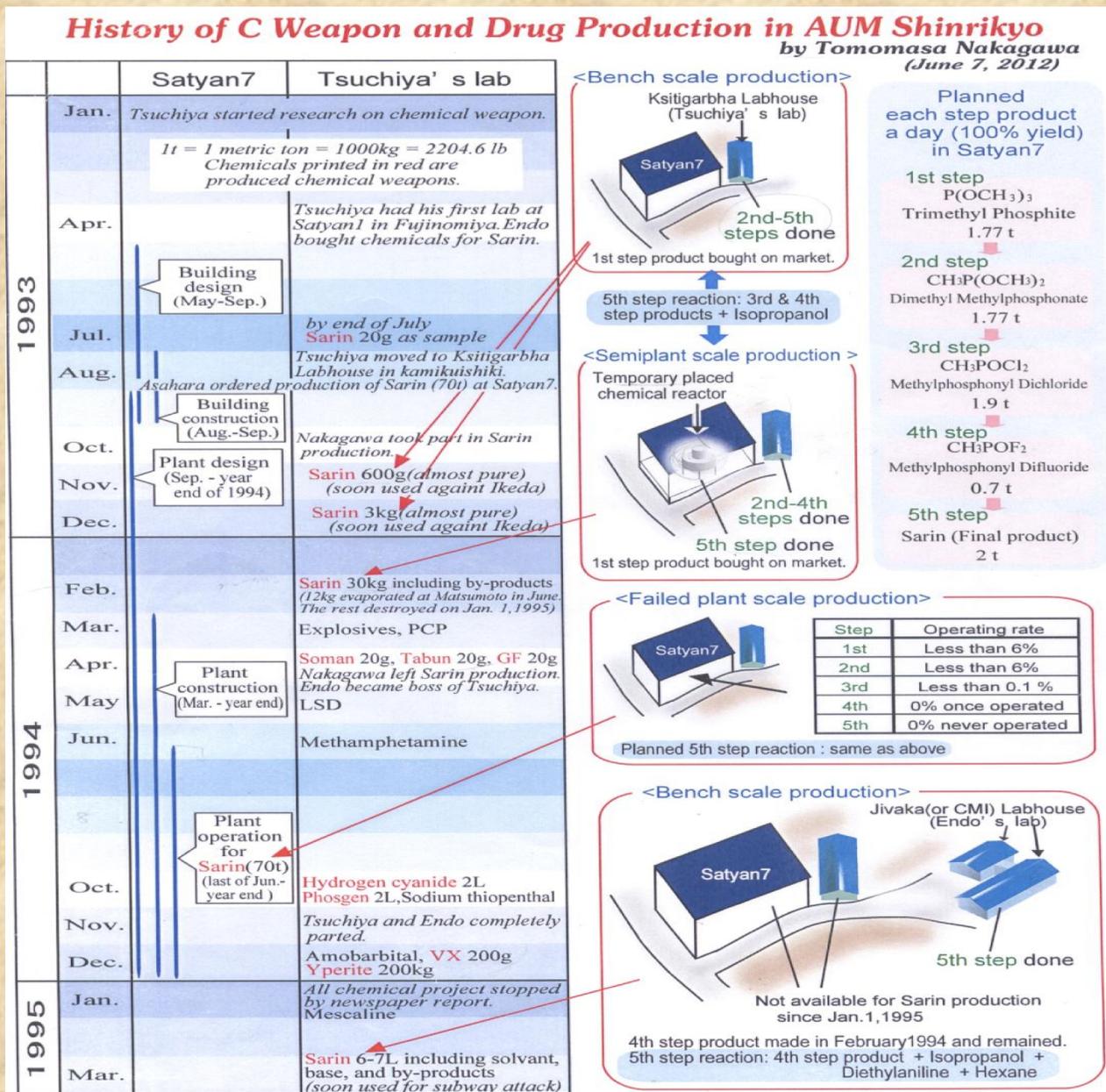
I thank Dr. Nakagawa for sending me this picture on November 7, 2012. He said that if I needed to use his photo for my future article, I should use this picture he sent me. He said he does not have any new photos since he was locked up because photography is not allowed. The



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photo he gave me must have been taken before his arrest in 1995.

Before my second meeting with Dr. Nakagawa he sent me a summary of Aum's CW and drug manufacturing. He told me to bring it so that he could explain it to me when we met. I thought this one page summary was well made and I would like to show it to the readers of this article.



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Combat Casualty Care and the Development of Tactical Emergency Medicine

By Marc Dugas

Introduction

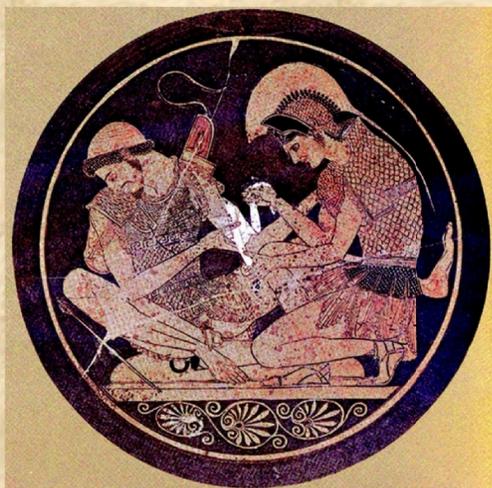
This essay is a compilation of current knowledge available on the historical development of Combat Casualty Care, and its evolution into Tactical Emergency Care. With the conflicts in the Middle East and the resurgence of Active Shooter events and I.E.D. usage worldwide, there is a great deal of interest and training occurring in the topics of rapid casualty care methods under active combat conditions, especially in the civilian setting.

Historical developments are placed in context within the essay for the interest of the reader, and include content on ballistic injury, blast injury, weapons and tactics development, combat psychological conditioning, tactical patient assessment, field treatment, and commonly available casualty care equipment.

Editing of original documents has been performed to simplify, shorten, or target the information to a broader audience.

Surgical Experience From Warfare

There are Egyptian medical documents surviving from 1600BC, describing care for war injuries. In Greece, as reported in the Homeric poem *The Iliad*, composed in the 700s B.C., provides what some consider to be the first written description of the treatment of battle wounds.



Wound care depicted on early Greek pottery, dated 500 BC.

Hippocrates (460–377 B.C.) authored a number of medical texts on combat injuries. His writings on surgery recommended using only wine to moisten a wound, giving little food and no drink but water for all injured patients including those with abdominal wounds, prohibition of walking, standing, and even sitting, and making pus form in the wound as soon as possible for the counterintuitive reason of reducing inflammation. Insertion of a tube in the chest wall for pus drainage and the use of traction for fracture alignment are described. The oath attributed to Hippocrates is considered to be the earliest codification of medical ethics.

The shift of the center of medical progress to Rome over the next 4 centuries was accelerated by Galen, 130–200 A.D., who began his practice as physician in Rome. His success in treating the wounds

of gladiators attracted the attention of the emperor, Marcus Aurelius, who made Galen his personal physician. Galen was the author of some 400 works in which he describes trepanning of the skull, and intestinal or abdominal wall suture of penetrating abdominal wounds of gladiators. He was also a proponent of assuring that pus forms in wounds, which was ultimately detrimental to the health of the casualty.

Surgical progress was impeded in 1163 when religious leaders issued the “Ecclesia Abhorret a Sanguine” (“the church abhors bloodshed”) edict, which removed surgery from the practice of physicians, in effect assigned an inferior status to surgical practice as compared with the practice of medicine, which further separated the two.

Henri de Mondeville of France became a strong proponent of healing without infection and pus during the 14th century. He proposed that foreign objects be removed immediately, that all bleeding be stopped, that the wound be closed and then dressed with compresses soaked in hot wine.

In 1497, Hieronymus Brunschwig authored the first book to describe treatment of firearm wounds. He promoted the idea that such wounds were poisoned by gunpowder, providing the rationale for cauterizing all war wounds and initiated a controversy that persisted for 300 years, before being debunked in the latter half of the 1700’s.



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William Clowes was recognized as the greatest surgeon in Elizabethian England. In 1596, on the basis of his surgical training and experience in the British Navy, Clowes published a book for young surgeons in which he advocated debridement, extraction of foreign bodies, and avoidance of cauterization in treating wounds. Despite these advancements in medicine, treatment for battlefield injuries through the 1600's consisted of variable combinations and doses of bloodletting, sweating, emetics, laxatives, and enema.

During the Revolutionary War in 1775, trepanning head injuries, amputation of limbs, setting fractures, and surgical removal of bullets were put into practice with good results. To avoid life-threatening infections, compound fractures were commonly amputated. Burns were treated by topical applications, which ranged from spirit of wine for superficial scalds to hog's lard for deep full-thickness burns. Bloodletting was a prominent feature in the treatment of serious burns involving muscle and was supplemented with enemas and purgatives.

The Baron Dominique Jean Larrey, Napoleon Bonaparte's surgeon, improved the care of combat casualties by use of a light horse-drawn "flying ambulance" to effect rapid evacuation, which permitted immediate amputation of severely injured limbs on the battlefield. Larrey's system of battlefield care was put to the test in 1793 at the Battle of Metz and was successful in creating a 75% survival rate.

The first use of anesthesia in military casualties occurred during the Mexican-American War. Dr. Edward H. Barton used ether to amputate a leg on March 29, 1847 and at least a dozen more times in the next 3 weeks to operate on wounded soldiers.

During the Crimean War of 1854, Florence Nightingale and her cadre of 37 nurses coordinated medical relief activities, emphasizing sanitation and hygiene in the hospitals, resulting in a striking reduction of death from disease. During the American Civil War, the battle of Bull Run epitomized the state of surgical care for the wounded. Many injured lay on the battlefield for days without food, fluid, or medical care. The wounded often lay in farmers fields where manure was used as a fertilizer. Infection was common and often killed soldiers faster than bullets. There were no field hospitals or ambulances, physicians were untrained, there was no anesthesia during procedures, and surgical equipment was often used over and over without being sanitized.

Penetrating abdominal wounds, typically not operated upon, had an overall mortality of 87%. Surgical intervention was also uncommon in the treatment of chest wounds, which, if caused by gunshot, were associated with a mortality of 62%. Pelvic fractures produced 80% mortality. By the end of the war, use of anesthetics, the horse-drawn ambulance, and creation of field hospitals had improved casualty care, but battlefield mortality had not significantly changed. Infection was at the root of almost all deaths.



A horse-drawn hospital wagon and a patient being readied for surgery. The surgeon is examining the leg to be amputated and his assistant is using a cloth cone to administer the anesthetic.

Beginning in 1861 with his identification of bacteria as a cause of putrefaction, Louis Pasteur developed vaccines for both human and animal infections. Building on Pasteur's findings, Joseph Lister developed a method of antiseptis

using a carbolic acid spray during operative procedures.

The Spanish-American War, which lasted 5 months in 1898, was the first conflict in which the benefits of Lister's discovery were realized on the battlefield. Antiseptic treatment of wounds began at the time of wounding by application of the antiseptic dressing carried in the first-aid package fastened to each soldier's cartridge belt.

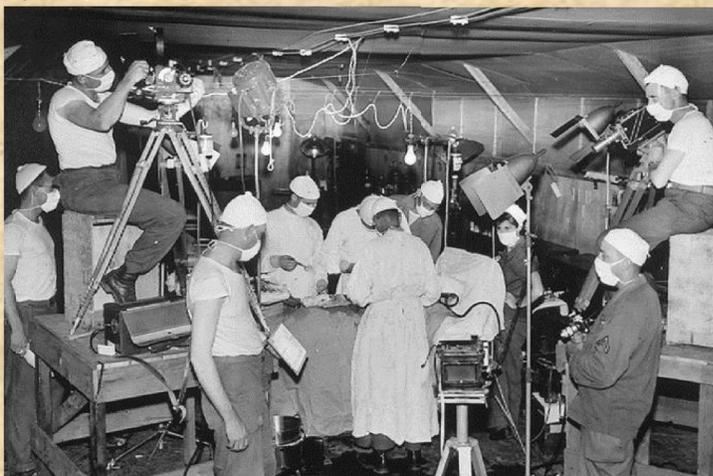
At the 1898 meeting of the Southern Surgical Association, the advisability of laparotomy for casualties with penetrating abdominal wounds was prominently discussed. It took another 16 years before it was accepted as a standard of practice as the best way to deal with infections from abdominal wounds. Combined with antiseptic treatment, mortality improved.

In 1901, Karl Landsteiner described the A, B, and O blood groups and in the following year, Sturli and De Castello described the fourth, or AB, blood group. The subsequent development of in vitro



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testing for compatibility reduced the risk of complications and expanded the use of blood transfusions. The discovery of x-rays by Wilhelm C. Roentgen in 1895 was quickly followed by the development of x-ray equipment used by the military, allowing surgeons to pinpoint injuries and fragments during WWI. The use of anti-tetanus serum improved casualty care in WWI by essentially eliminating tetanus as a complication of war wounds. Although transportation could be delayed for hours by the weather or the tactical situation, casualties generally benefitted from more rapid transportation by motorized ambulance to where warfare surgical care could be provided by surgical specialists. The discovery of penicillin in 1929 by Alexander Fleming as the first effective antibiotic aided the survival of surgical patients. In the early years of the Korean Conflict (1950-1953), evidence of renal failure was present in slightly more than one third (36%) of autopsied casualties. After 1952, the prompt infusion of adequate volumes of resuscitation fluid to injured patients reduced the occurrence of renal failure to 0.5% of autopsied casualties.



MASH Unit, Korean War

Other advances that benefitted the injured soldier in the Korean Conflict were the development of the forward care surgical facility, Mobile Army Surgical Hospital (MASH), the first use of helicopters to transport casualties, and the use of prophylactic hemodialysis to minimize or avoid the complications of renal failure. The amputation of limbs with arterial injury ceased and limbs were salvaged by direct vascular repair and arterial replacement.

Additional improvement in the care of combat casualties was evident in the Vietnam conflict. Certified surgical specialists permitted full staffing of forward treatment facilities. The routine use of helicopters for patient transport resulted in the rapid transport, admission and treatment of patients who in previous conflicts would have never reached the hospital.



Bell casualty helicopter

The care provided those patients was state-of-the-art in terms of mechanical ventilation, physiologic monitoring, and fluid resuscitation and achieved further reduction in mortality of casualties with penetrating wounds and visceral injuries. Surgeons in Vietnam identified adult respiratory distress syndrome (ARDS) as a complication of severe injury and raised concern over its relationship to excessive fluid resuscitation.

With each successive generation of warfare, innovations and knowledge obtained from previous conflicts has evolved into the modern combat casualty care we recognize today, resulting in greater survivability of war wounds.



Weapons and Tactics Development

Beginning in 1860 the pace of weapons development increased enormously as the Industrial Revolution produced one technological advance upon another. The overall consequence of these circumstances was the rapid application

Factors Influencing Progress in Combat Casualty Care

- I. Impediments
 - A. Tyranny of surgical dogma
 - B. Ecclesiastic dicta
 - C. Lack of knowledge and qualifications
 - D. Lack of sanitation and impact of comorbid conditions
 - E. Absence of effective reliable trauma care system
- II. Accelerators
 - A. Expansion of knowledge base
 - B. Prompt application of new technology
 - C. Availability of residency trained board certified surgeons
 - D. State of the art logistical capability
 - E. Integrated clinical/laboratory research program

of new weapons and other technologies of war to the battlefield at a pace never seen before in history, with the corresponding result that weapons became more lethal than ever.

Before a new weapon can reach its killing potential, military commanders have to discover new methods of fighting in order to bring the new weapon to bear in a manner that maximizes its killing potential. Once the killing power is exposed for all to see, however, one's opponent adopts passive and active means for limiting the most deadly effects of the weapon. This, in turn, requires new changes in tactics and combat formations in an attempt to preserve the killing power of the new technology.

In calculating the killing power of weaponry, any failure to adapt either weapons or tactics to new

circumstances can be catastrophic. The failure of the World War I armies to alter their battle tactics in light of the machine gun's enormous rates of fire resulted in horrendous casualties in the early days of the war. The refusal of British commanders at the Somme to change their practice of massed infantry attacks against entrenched positions resulted in 54,000 men being killed or wounded in less than 10 hours.

When measured against the non-gunpowder weapons of antiquity and the Middle Ages, modern weapons (excluding nuclear weapons) have increased in lethality by a factor of 2,000. But while lethality has increased, the dispersion of forces on the battlefield made possible by mechanization and the ability of fewer soldiers to deliver more firepower has increased by a factor of 4,000! The result (with the exception of the Napoleonic wars which utilized the tactical field formation of the packed marching column) is that every war since 1600 has resulted in a decline in battle casualties even as the lethality of weapons increased.

Psychological Conditioning

There exists a powerful, innate human resistance toward killing one's own species, requiring psychological mechanisms to be developed by armies over the centuries to overcome that resistance. In both World Wars, 75 to 80 percent of riflemen did not fire their weapons at an exposed enemy, even to save their lives and the lives of their friends. In previous wars non-firing rates were similar.

During the Vietnam conflict, special training reduced the non-firing rate to as low as 5 percent. This was due to development of **operant conditioning**, which involved implementing specific conditioning methods, such as;

- reflexive shooting at human shaped popup targets;
- repeatedly double tapping automatically at center of mass;
- creating cultural distance, such as racial and ethnic differences, which permit the killer to dehumanize the victim;
- creating moral distance, which creates intense belief in moral superiority and justifies vigilante and revengeful actions;
- creating social distance, which results in thinking of a particular class as less than human in a socially stratified environment;
- creating mechanical distance, which includes the sterile video-game unreality of killing through a TV screen, a thermal sight, a sniper sight, or some other kind of mechanical buffer that permits the killer to deny the humanity of his victim.



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Operant conditioning, therefore, creates an effective killing psychology that allows soldiers to overcome their normal reluctance to harm others.

Advantage Of Crew-Served Weapons

Throughout the history of warfare, it was patently obvious that when crews operated certain weapons, such as chariots, artillery, or machine guns, they did not have the normal resistance to killing that individual riflemen had. Though the rationale was not clear, military leaders recognized it and used them very effectively. The reasons crew-served weapons were responsible for most combat related deaths were that artillery, sniper, and machine gun crews had an authority figure to direct them, they worked in teams, and they killed at a large physical distance. All these factors acted to disperse responsibility and allow the soldier to distance himself psychologically from the kill. Anonymity and accountability in close proximity groups provided them a greater degree of freedom to fire on the enemy, resulting in higher casualties than individual riflemen could inflict.

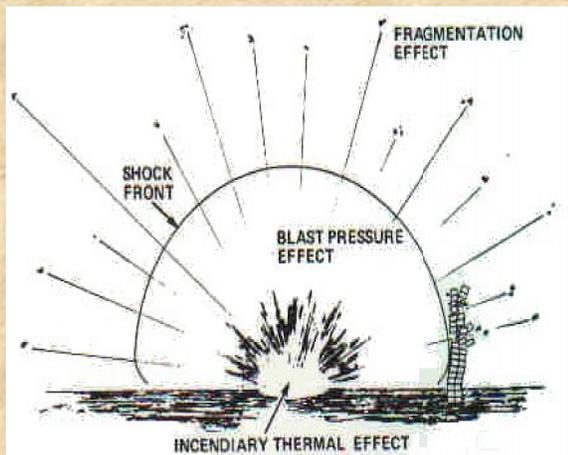
Combat Casualties

On the battlefield, the pre-hospital period is the most important time to care for any combat casualty. Up to 90 percent of combat deaths occur before a casualty reaches a medical treatment facility. This highlights the primary importance of treating battlefield casualties at the point of injury, prior to casualty evacuation (CASEVAC) and arrival at a treatment facility.

Specifically, combat deaths result from the following:

- 31 percent: Penetrating head trauma
- 25 percent: Surgically uncorrectable torso trauma
- 10 percent: Potentially correctable surgical trauma
- 9 percent: Exsanguination
- 7 percent: Mutilating blast trauma
- 3–4 percent: Tension pneumothorax
- 2 percent: Airway obstruction/injury
- 5 percent: Infection and shock

Mechanisms of Injury: Blast and Ballistics



Blast Injuries

Explosions inflict injury to individuals, in four general categories. These are as follows:

Primary Blast Injury is due solely to the direct effect of the pressure wave on the body. It does so through three methods. The first is spalling. This occurs when a blast pressure wave encounters tissues of different densities causing cavitation and turbulence which results in the denser tissue being thrown (spalled) into the less dense tissue.

The second method is implosion, which occurs when a blast pressure wave passes through an organ containing gas, causing a rapid compression and decompression. The

instantaneous re-expansion of the gas, following the passage of the wave, creates small secondary explosions. The third method involves inertia. This is the shear stress created when the wave moves through tissues of different densities at different speeds, rupturing the interface between them.



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Secondary Blast Injury results from penetrating or blunt damage caused by projectiles or secondary missiles, energized by the explosion, striking the victim. These may be in the form of shrapnel (fragments of the explosive devices casing), projectiles built into the device, or debris from the incident site.

Tertiary Blast Injury occurs when the victim’s body becomes displaced and impacts against stationary objects. Tertiary effects generally result from the massive flow of gases (blast wind) away from the epicenter, and happen when the victim is in very close proximity to the explosion.

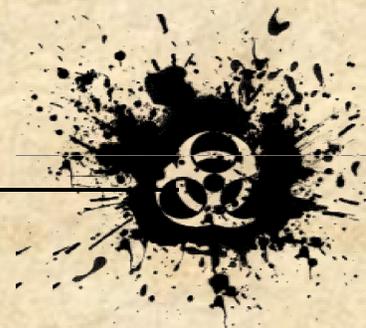
Quaternary Blast Injury include thermal injury due to exposure to the hot gases, and fire; traumatic injury due to the collapse of structures, and toxicity resulting from the exposure to, and/or inhalation of, the toxic gases produced by the explosion.

Blast Pressure Required To Cause Injury

Injury	Pressure (kilopascals)
Ear drum rupture	35
Lung damage	103
Lethal threshold	207-289
50% fatality	290-393
95-100% fatality	400-550

Category	Characteristics	Body Part Affected	Types Of Injuries
Primary	Results from impact of over-pressurization with body surfaces	Gas filled structures damaged – lungs, GI tract, ears	Blast lung, eardrum rupture, abdominal bleeds, eye rupture, traumatic brain injury
Secondary	Results from flying debris	Any contact surface	Ballistic or blunt injuries
Tertiary	Results from being thrown by blast wind	Any contact surface	Fractures, amputation, brain injury
Quaternary	Smoke, gas, fire, CBRN agent damage	Any contact surface	Burns, crush injuries, respiratory

System	Injury Or Condition
Auditory	Eardrum rupture
Eye, Face	Perforated eye, air embolism, facial fracture
Respiratory	Blast lung, hemothorax, pneumothorax, pulmonary contusion, sepsis
Digestive	Bowel perforation, hemorrhage, ruptured spleen/liver, sepsis
Circulatory	Cardiac contusion, MI from air embolism, vasovagal hypotension, air embolism
CNS injury	Traumatic brain injury- stroke, spinal cord injury, embolism
Renal injury	Renal contusion, laceration, acute failure
Extremity injury	Amputation, lacerations, crush, compartment syndrome, burns, embolism injury



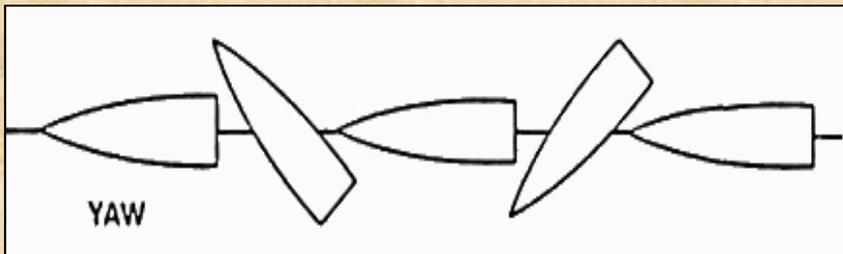
Ballistic Injuries

The degree of tissue disruption caused by a projectile is related to the size of the temporary versus permanent cavity it creates as it passes through tissue. The extent of cavitation, in turn, is related to the kinetic energy, yaw, deformation in flight, and fragmentation of the bullet.

KINETIC ENERGY

$KE = mv^2$ (where m is mass and v is velocity). The higher mass or velocity of the bullet will produce greater tissue disruption than missiles of lower mass and velocity, resulting in greater temporary cavitation.

YAW



Yaw occurs when the bullet rotates around its axis of flight, creating a wider path as it penetrates flesh, resulting in stretching the tissue more than normal, forming a wider permanent cavity.

DEFORMATION

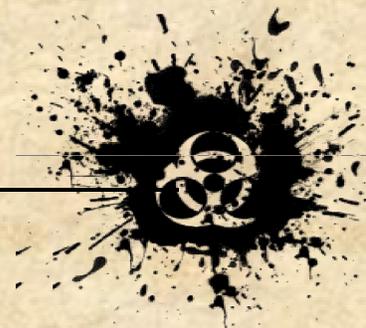


Deformation can occur in flight, such that a hollow point bullet can mushroom and widen before it hits flesh, or it can occur as soon as it impacts the skin. This crushes the tissue surrounding the wound, which makes clotting difficult and causes profuse bleeding.

FRAGMENTATION



Fragmentation of a bullet creates multiple wound tracks, each of which increases the area of crushed tissue and overall contribution to hemorrhage.



CAVITATION

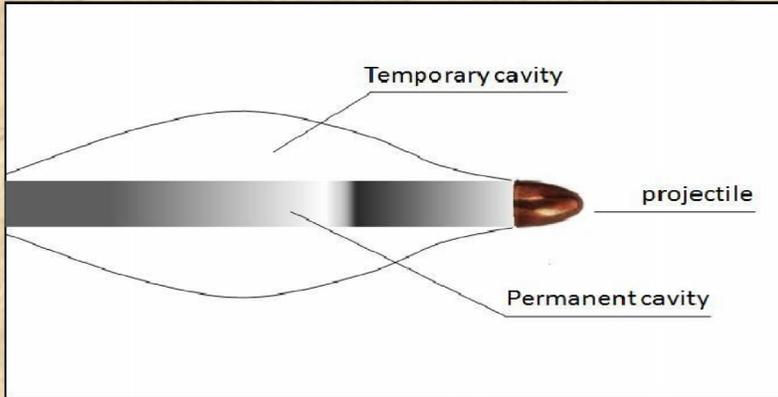
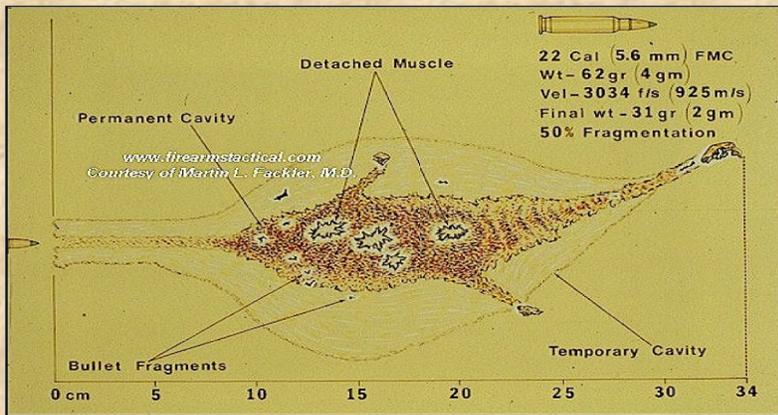


Diagram of Cavitation Effects



Example of Permanent Cavity in a Head Shot



Ballistic Damage from a Bullet

From this understanding of blast and ballistic injuries, combat casualty care specialists developed a methodology to triage and deal with battle injuries beyond the field dressing.

Combat Triage Principles

On the battlefield, casualties will fall into three general triage categories:

1. Casualties who will die, regardless of receiving any medical aid.
2. Casualties who will live, regardless of receiving any medical aid.
3. Casualties who will die if they do not receive timely and appropriate medical aid.



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Combat Casualty Care Considerations

- Hostile fire may be present, preventing the treatment of the casualty.
- Medical equipment is limited to that carried by mission personnel.
- Tactical considerations may dictate that mission completion take precedence over casualty care.
- Time until evacuation is highly variable (from minutes to hours or days).
- Rapid evacuation may not be possible based on the tactical situation.

Stages of Care

In thinking about the management of combat casualties, care is divided into three distinct phases, each with its own characteristics and limitations:

- **Care under fire** is the care rendered at the point of injury while both the medic and the casualty are under effective hostile fire. The risk of additional injuries from hostile fire at any moment is extremely high for both the casualty and medic. Available medical equipment is limited to that carried by the medic and the casualty.
- **Tactical field care** is the care rendered by the medic once he and the casualty are no longer under effective hostile fire. It also applies to situations in which an injury has occurred on a mission but there has been no hostile fire. Available medical equipment is still limited to that carried into the field by mission personnel. Time to evacuation may vary from minutes to hours.
- **Tactical evacuation care** is the care rendered once the casualty has been picked up by an aircraft, vehicle, or boat. Additional medical personnel and equipment that has been pre-staged in these assets should be available during this phase of casualty management.

Tactical Emergency Medicine (TEM) Development in the Non - Military Theater

In non-military civilian populations, development of tactical medicine evolved from tactical combat casualty care (TCCC), with the priorities recognized as extremity hemorrhage (60%), tension pneumothorax (33%), and airway obstructions (6%) as the primary causes of death to civilian and law enforcement personnel. With regard to the law enforcement special operations response, threat environments are precipitated by critical incidents such as hostage situations, active shooter scenarios and terrorist incidents.

For TEM providers, the threat environment impacts acute care delivery in four significant ways:

1. First, TEM providers must maintain situational awareness of their surroundings while simultaneously providing effective patient care.
2. Second, several restrictions to care are imposed by this environment including the limited amount of medical equipment that can be carried by a TEM provider in the field, the need for prolonged extraction under hostile conditions and the need to operate behind cover with light and noise discipline.
3. Third, the casualty profile is shifted toward the potential for significant penetrating trauma, explosive blast injuries, multiple victims, delayed definitive care and contaminated patients.
4. Fourth, medical decision-making is impacted by the need for risk-benefit assessment. The benefits of proposed medical interventions (such performing cardiopulmonary resuscitation on a patient must be weighed against the potential for further harm to team members when the intervention is conducted under hostile conditions.

Zones in Tactical Medicine

The Hot Zone in tactical medicine refers to situations in which the provider and patient are under direct fire. Under these conditions, the best medicine is often fire superiority and patient extraction. If absolutely needed, medical care should be limited to rapid insertion of a nasal airway or application of a tourniquet. The Warm Zone refers to the “islands of cover” within a tactical environment where the provider may provide focused life-saving intervention for the patient. While not under direct fire, TEM providers in the Warm Zone must still be ready to react rapidly if shifting conditions suddenly put their patients in jeopardy. The



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Cold Zone designates the area outside the scope of the threat where traditional emergency care may be safely performed.

Tactical Primary Survey

A tactical primary survey (TPS) may be recalled by the memory aid “MABCDE” which stands for Massive Bleeding (M), Airway (A), Breathing (B), Circulation (C), Deficit and Decontamination (D) and Expose (E). As with the traditional primary survey, each step is performed in sequence and stabilized prior to proceeding to the next stage. For the TPS, however, there is a different emphasis necessitated by care in the threat environment.

Massive Bleeding (M) is addressed even before airway management. In tactical medicine, there is a critical focus on stopping life-threatening bleeding first.



OLAES combat dressing

Since it is difficult to maintain direct pressure effectively under combat conditions, the technique of choice for rapid bleeding control is the tourniquet, which should be applied early. Subsequent bleeding control involves efforts at de-escalating from the tourniquet to less aggressive approaches such as pressure bandages. The tourniquet may be left in place for up to four hours. Once under cover, a hemostatic agent, like Quick Clot, is appropriate for uncontrolled bleeds in combination with pressure dressings, like the Israeli style dressing.



Combat application tourniquet

Airway (A) management is also affected by conditions of the tactical environment. Because they can be effectively and efficiently applied, basic airway skills are emphasized for immediate airway support. The nasal airway is particularly valued because of its versatile application in all patients regardless of a gag reflex. Rescue devices, such as the King Airway or Combi-Tube, play an increased role under tactical conditions because they can be inserted blindly and quickly. When a definitive airway is



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required under volatile conditions, digital intubation is preferred over oro-tracheal intubation because its placement does not involve a light signature or loss of situational awareness.

- Lubricate!
- Insert along floor of nasal cavity
- If resistance met, use back-and-forth motion
- Don't Force – Use other nostril
- If patient gags, withdraw slightly



Nasal Airway

Conversely, cervical spine immobilization is not routinely recommended for victims of penetrating trauma under tactical conditions. Given the low incidence of occult unstable fractures in this situation, the practice of applying a cervical collar and backboard to these patients under hostile conditions likely places the patient and the extracting team unnecessarily under increased risk of harm. Types of

trauma resulting in neck pain or unconsciousness can be treated with spinal immobilization, unless the danger of hostile fire constitutes a greater risk in the judgment of the medic.

Breathing (B) management in the tactical setting focuses on care for penetrating chest wounds. In general, application of occlusive bandages to such chest wounds should be reserved for instances of true “sucking chest wounds”. Under conditions where continually monitoring a patient’s condition may be difficult, routine application of an occlusive dressing raises the likelihood for the evolution of an undetected (and very lethal) tension pneumothorax. For similar reasons, current tactical medicine training emphasizes early needle thoracostomy in patients with



penetrating chest trauma to avert this preventable progression to tension pneumothorax.

Asherman occlusive dressing in place

Circulation (C) - There is virtually no survival for victims who die in the field from penetrating trauma, so cardiopulmonary resuscitation (CPR) is generally not performed in the tactical setting, particularly if it places others at risk in a hostile situation.

Fluid administration for trauma victims follows a tiered approach: (1) placement of a saline lock but no fluid administration for patients with no signs of shock and controlled bleeding; (2) fluid resuscitation to normalization of vital signs for victims with signs of shock but controlled bleeding; (3) fluid resuscitation to restore mental status or radial pulse in victims of shock from uncontrolled internal bleeding.

Fluid administration for trauma victims

Deficit/Decontamination (D) – This stage of the TPS is fairly straightforward. Mental status is assessed as in traditional care with the AVPU scale or the Glasgow Coma Scale (GCS). In the tactical field setting, emphasis on mental status gives you an idea of whether your patient is critical or not.

Decontamination is a capability that TEM field providers should be proficient in. Once the critical life threats are managed, decontamination in a CBRN environment may simply consist of removing all outer layers of clothing and a wipe down with an agent like reactive skin decontamination lotion (RSDL) to reduce up to 90% of contaminants.



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Expose (E) – The decision to expose patients to assess the severity of injury must balance the need to uncover occult injury against the potential harm posed by both environmental factors and threat conditions. It is important to adequately search for the presence of previously unknown penetrating injury. However, in the tactical setting, it is also essential to protect the patient against hypothermia and the potential for further penetrating trauma from additional gunfire.



Tactical Medical Operator performing a primary survey with limited body exposure.

Transportation methods

Standard litters for patient evacuation may not be available for movement of casualties in the care under fire phase. Consider using alternate methods of evacuation, such as SKED or Talon II litters or dragging the casualty out of the field of fire by his web gear, poncho, or even a length of rope or webbing with

a snap link. There are a number of drag straps and drag litters available to help expedite this move. Traditional one and two-man carries are not recommended, as the weight of the average combatant makes these types of casualty movement techniques extremely difficult.



SKED System in action

A “grab and drag” method is not the most effective, because the upper body strength required to drag a fully kitted injured operator is enormous, and exhausting. A drag harness made from webbing and wrapped around the casualty allows one or two rescuers to raise the casualty slightly, reducing friction, and then use the greater strength of the legs to rapidly exfiltrate the casualty to cover.



Drag harness made from 20 feet of 1” webbing



Hypothermia

Prevention of hypothermia is critical to patient survival. Warm IV solutions, getting the casualty off the ground, and actively preventing heat loss with a thermal blanket or other device is necessary, as even the mildly hypothermic casualty is prone to reduced blood coagulation and increased blood loss.

Tactical First Aid Kit

The tactical first aid kit increases the chances of survival for leading causes of death on the battlefield: severe hemorrhage, tension pneumothorax and inadequate airway. The following medical items are considered necessary:

- Nasopharyngeal airway
- Exam gloves (4)
- 2-inch tape
- Trauma dressing, OLAES or Israeli style
- Rolled sterile gauze for wound packing.
- Combat application tourniquet
- Occlusive dressing
- Hemostatic agent (optional)



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