

Germar Rudolf

The
Chemistry
of
Auschwitz

The Technology and Toxicology
of Zyklon B and the Gas Chambers

A Crime-Scene Investigation



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Preface

While I was making the last changes to this book in preparation for its publication, yet another Holocaust Remembrance Day – January 27th – passed with its many commemoration events. On that memorable day in 1945, the Red Army overran the infamous Auschwitz Camp. For the Politics of Memory, it is business as usual. Those equipped with finely tuned societal seismographs, however, have noticed that something is afoot.

The most-recent indicator for this was an article written by Jewish activist David Cole, and published in the conservative mainstream periodical *Taki's Magazine* (Cole 2016). Cole had been dabbling for a while in Auschwitz research, and had burned his fingers in the process. Yet he had gained some insights which are worth considering. We will encounter him and his work later in the present book. In the just-mentioned article, Cole had the following to say about Auschwitz:

“Ah, Auschwitz. Yes, here’s where we still have a problem. [...] there are genuine problems with what is commonly claimed to be part 3 [of the Holocaust]—that in 1943 Auschwitz-Birkenau was ‘renovated’ to become an ultra-super be-all end-all extermination facility. To me, the evidence just isn’t there, and the evidence that does exist calls that claim into question. [...] Orthodox historians] backed themselves into a corner by putting Auschwitz, with its phony, postwar tourist-attraction ‘gas chamber’ and its complete lack of documentary evidence supporting a killing program, front and center as the heart of the Holocaust. They’re in so deep at this point that they can’t back off. It’s surprisingly easy to get the leading lights of anti-denial to admit as much one-on-one. Rick Eaton has been the senior researcher at the Simon Wiesenthal Center for thirty years. He’s as major a player in the fight against Holocaust denial as anyone on earth. Two years ago, I corresponded with him (under a pseudonym, of course... he’d never speak directly with the likes of me!) regarding the Auschwitz problem. I explained my thesis to him, that Auschwitz, having various ‘issues’ that call the credibility of extermination claims into question, should not be used to represent the Holocaust. He agreed [...].

Keep in mind that even though I was using a pseudonym, I was not



David Cole

falsely claiming to be anyone of note. In other words, Eaton made that admission to a complete nobody, a total stranger. One gets the feeling that many of these experts are secretly longing for the day when they can be open about the 'Auschwitz problem' and move past it [...]."

If you want to find out why we have a problem with Auschwitz, the answer is in your hands, because the research forming the basis of the present study is what made Cole and other Jewish intellectuals take a closer, critical look into the orthodox Auschwitz narrative. In fact, in order to get an update on the latest research results, Cole got in touch with me in order to get some input before preparing the above article, among other things.

So, if the historian Eaton from the Simon Wiesenthal Center and Cole can acknowledge that this research has revealed a profound problem with the mainstream Auschwitz narrative, can't we all do the same?

Of course we can.

But when I started to take a look at that "problem" in the late 1980s, it wasn't a matter of course at all. A good part of that trail had yet to be blazed, and it wasn't going to be easy. Let me briefly describe my journey along that path as a primer to what you are going to read in this book.

As a German citizen, I started my journey in that country. In 1985, while I was studying in West Germany's capital Bonn, the West-German parliament discussed whether the law should be tightened in order to make things more difficult for Holocaust deniers. At that time, I was merely 20 years old and still in the first half of my university studies of chemistry. I did not object to tightening the law against Holocaust deniers. After all, who could argue against outlawing the vile propaganda lies of Nazis, anti-Semites and other extremists? For justice's sake, however, I thought back then that such laws should be applied equally against the deniers of all genocides.

Roughly a year later and by mere coincidence, I actually met such a denier for the first time, a self-declared right-wing radical. Discussing the topic with him at a bar under the influence of a couple of beers left some bad-tasting memories. His arguments, for instance that it wasn't six but "only" three million victims, seemed crass at best. Although I agreed with his analysis that the Holocaust is misused to suppress patriotic movements in particular in Germany, his evident political motives made me deem him untrustworthy.

Another three years later, a libertarian friend of mine gave me the book *Was ist Wahrheit? (What Is Truth?)* by Paul Rassinier. Rassinier, a French socialist, had established his own pacifist resistance group against the German occupiers during the Second World War. In that context, he helped Jews flee to Switzerland. He was caught by the Germans and promptly deported to the Buchenwald Camp. A short while later, he was sent to the underground production facility of the so-called "*V-Waffen*" (retaliation weapons = missiles) of the Mittelbau Concentration Camp under terrible circumstances. He survived

the war only barely. What would you expect such a person to write about his experiences in the camps?

What I read in this book was the opposite of what I had expected. Rassinier accuses his fellow inmates of exaggerations and lies, and he profoundly challenges the traditional Holocaust narrative. He gives all kinds of reasons for this, and although I considered them comprehensible, they were difficult to verify. His book could not so easily be swept aside as the drivel of a Nazi and anti-Semite, simply because Rassinier was not a Nazi, quite to the contrary. He was not a perpetrator, but rather a victim; not an anti-Semite, but someone who had risked his life to help Jews. This book turned my moral worldview upside down. But because I was not a historian, I neither felt called upon nor competent to do anything about the matter.

A few months after that, in the summer of 1989, I read another book which dealt with the political misuse of Germany's attempt to come to terms with its past. The author was the Swiss political scientist Dr. Armin Mohler, who had researched and published on this topic since the 1960s. I had read earlier editions of his relevant studies. Yet what I read in this new edition was a little too much to digest: Mohler reports in it that a U.S. expert for execution technologies had recently (1988) written an expert report, in which he claimed to have proved that the purported gas chambers at Auschwitz and Majdanek could neither have functioned nor been used as such. One of his arguments were chemical analyses that showed that no traces of the poison gas used back then – “Zyklon B” – could be detected in the walls of the gas chambers.

Excuse me? How can you look for traces of *gas* 45 years later and expect to find anything in the first place? GAS! Hello?!? Gas blows away; it's that simple.

Or maybe it's not that simple. Back then I was in the process of writing my master's thesis, hence was about to become an accredited chemist. But I was too stupid to understand why somebody would carry out analyses like that. Therefore, I went to the library of the research center where I was working at that time, and I consulted a chemical encyclopedia. Question: What is “Zyklon B”? Next question: Can this substance cause a chemical reaction which makes it possible to find chemical traces in exposed masonry in the long run? And if so, what kind of reaction? And under what circumstances? And which factors would influence that reaction? And how stable are the products of that reaction? And, and, and...

These questions were all basically chemical in nature, hence within my field of professional expertise. The problems were hair-raising, and the repercussions of any solution to this problem were possibly far-reaching. What should I do? This time I could not talk my way out of it by claiming that I am not a chemist and could therefore not contribute anything.

As a first step, I got myself a copy of the report by that U.S. expert. That in itself was an obstacle course, because it turned out that the German edition of this technical report had been banned in Germany where the constitution expressly says that censorship does not exist. Well, great! I instantly asked myself: “Where the heck do we live?” So, I got myself an English edition instead, which I translated step by step. While so doing, I found factual mistakes and deficiencies galore which, as it turned out later, were only the tip of the iceberg (on this see my footnotes and comments in Leuchter *et al.* 2015). Something had to be done to iron out those shortcomings and to put that entire matter on a solid foundation. But who would tackle such a hot potato?

If I get involved in that matter, doesn't that amount to my admitting indirectly that the question “Were there any homicidal gas chambers at Auschwitz?” could be answered any differently than with a YES? By taking that question seriously, doesn't that turn me into a doubter? Doesn't that make me already half a denier? A justifier of the propaganda of Nazis, anti-Semites, right-wing radicals, and so on? Do I want that?

I was raised in a society which indoctrinates people that they must not doubt the orthodox Holocaust narrative; that doubting it is evil. Hence, I felt guilty only because Rassinier and this U.S. execution expert had aroused doubts in my mind. At the same time, however, I was convinced that this feeling of guilt wasn't right; that a society which condemns doubt and ostracizes doubters puts itself in the wrong. An enlightened society welcomes doubts and answers them with rational arguments. Only dictatorships suppress doubts and counterarguments, and persecute doubters and dissidents.

I was facing an interesting challenge that evidently went far beyond the chemical issues raised. How far it reached I did not quite fathom initially. This, however, was exactly what made the matter even more enticing. Hence, I accepted the challenge. The result of this you are now holding in your hands (or viewing on your screen) in an updated and greatly expanded edition.

I have described the events leading to the present book more thoroughly elsewhere, to which I refer the interested reader to Rudolf 2016c. Allow me to add a few words here about the history of this study. An early version of the present book had been written on request of a defense lawyer in the style of an expert report. Since late 1991, it was presented as evidence in criminal proceedings against so-called “Holocaust deniers,” and I myself appeared as a chemistry expert witness at various trials. I was never allowed to testify in court about that topic, though. Although German courts of law are not allowed to reject expert witnesses who are already in the courtroom and who can testify expertly on the case's matters of fact, that did not bother the respective judges at all. They simply violated German procedural rules, and one of these judges even threatened me with prosecution in case I dared testify along the lines of the defense's motion – before I had uttered even the slightest peep.

All kinds of personalities of public life pulled out all the stops to prevent me from continuing my activities as an expert witness. In the end, the German Federal Supreme Court even changed case law by determining that in Germany no one is anymore allowed under the threat of prosecution to even merely file a motion to introduce evidence which argues along the line of the present book.

The reason for this was explained to me in 1993 by Prof. Dr. Arndt Simon, at that time managing director at the Max Planck Institute for Solid State Research, where I worked on my PhD thesis back then:



Prof. Dr. Arndt Simon

“Every era has its taboo. Even we researchers have to observe the taboo of our era. We Germans may not address this topic; others have to do this. We have to accept that we Germans have less rights than the others.”

That can't be true, can it? Would you accept it, dear reader, if someone said, “Negroes have less rights than the others”? Or “Jews have less rights than the others”? If not, then why are some of you may be merely shrugging your shoulders when it is directed against Germans?

Hence, I wouldn't let go. Consequently, my situation grew increasingly precarious. I had even reason to fear that they would lock me up for my research and throw away the keys. Finally, the pressure on me became so unbearable that in 1996 I decided to leave Germany for good, which I succeeded in doing after quite a steeplechase. I have described the details of this post-history of the present book, which is considerably more dramatic than its pre-history, elsewhere as well (Rudolf 2012, 2016c).

In the present edition of this study, I could not include the biographical background of this book, which might be even more interesting to some than my technical and chemical studies. Doing so would have inflated the book to more than 700 pages. That was out of the question also because one version of this edition has been printed throughout in four colors due to the more than one hundred color illustrations. My biographical essays, however, hardly have any illustrations, hence it would have been inefficient in terms of production costs and hence sales price to include them here. I may point out, though, that

both of my autobiographical books can be downloaded from the internet as free PDF files:

- *Hunting Germar Rudolf*: germarrudolf.com/?p=3764
- *Resistance Is Obligatory*: germarrudolf.com/?p=1504

With that said, I wish you happy reading!

Germar Rudolf, Red Lion, Pennsylvania, USA, February 5, 2017

1. Prelude

1.1. Slow Death in U.S. Gas Chambers

On June 15, 1994, dramatic events unfolded during the carrying out of a death sentence. David Lawson, sentenced to death for a capital felony, was scheduled to be killed by hydrogen cyanide in the gas chamber located in the state prison of Raleigh, North Carolina – but the prisoner refused to assist his executioners.¹ Lawson repeatedly held his breath for as long as possible and took only short breaths in between.² Lawson exhibited enormous willpower, calling out to both executioners and witnesses throughout his execution:

“I am human.”

At first his cry was clearly audible, but as the minutes went by he became less and less understandable and finally, more than ten minutes into the execution, there was just a mutter. He was declared dead only after eighteen minutes. The witnesses to the execution were horrified. The warden of the prison, who had also supervised the execution, was so shaken that he resigned. Because of this execution fiasco, executions with poison gas have been abandoned for a short period of time in the USA and replaced with lethal injections.

By early March 1999, however, this horror had already been forgotten.

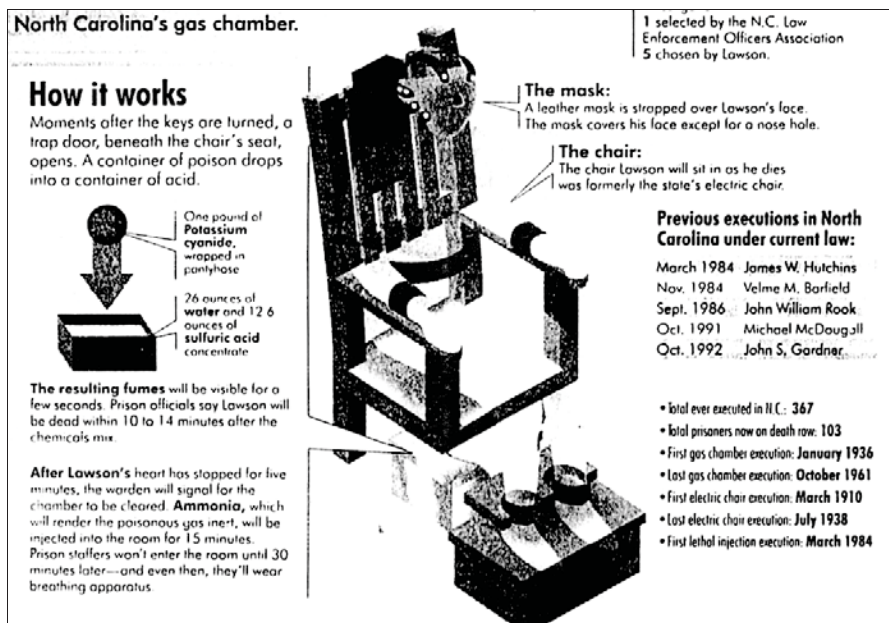


Figure 1: Schematic drawing of the U.S. execution gas chamber in North Carolina.⁴

¹ For a detailed description of this execution see Krueger 1994.

² “Killing Me...” 1993; *The New York Times*, October 6, 1994, p. A20; *ibid.*, June 16, 1994, p. A23.

This time, the victim was a German national. Despite intervention by the German government, Walter LaGrand was executed in the state prison at Florence, Arizona. LaGrand's death struggle against lethal cyanide gas lasted eighteen minutes. Thirty witnesses peered through a bulletproof window as the confessed, convicted murderer died horribly behind a steel-reinforced door.³

It is now clear to the experts, and especially to those still waiting on death row, that a quick and painless execution by gas requires the cooperation of the intended victim. Prisoners about to be gassed were usually encouraged to inhale deeply as soon as the cyanide was released in order to make their deaths come easily. However, if an intended victim was uncooperative, the execution could easily become a fiasco. By simply refusing to take the deep breaths needed to quickly inhale a lethal dose of cyanide, the agony could last for more than eighteen minutes, even under ideal conditions. Publications in the United States reveal that executions lasting from 10 to 14 minutes are the rule, rather than the exception. Amnesty International calls them "botched executions."⁴⁻⁶

The method used in US-American execution gas chambers was introduced in 1924. The expense to kill just one single person is tremendously high, since neither the witnesses, nor the prison personnel or the environment may be endangered by the poison gas released for such an execution. Reinforced-glass windows, massive, heavy, hermetically-sealed steel doors, powerful ventilation systems with a device to burn the evacuated poisonous gases, and a chemical treatment of the chamber interior to neutralize all remaining traces of the poison make this execution method the most cumbersome of all.⁷

During the last two decades of the 20th century, the only technical expert in the United States specializing in building and maintaining this equipment was Frederick A. Leuchter Jr., sometimes referred to in the media as "Mr. Death,"⁸ since his profession was the design, construction and maintenance of various kinds of execution devices.⁹

³ Freitag 1999; *Mannheimer Morgen*, March 5, 1999.

⁴ *The News & Observer*, Raleigh (N.C.), June 11, 1994, p. 14A (according to the prison warden, normally 10-14 min.).

⁵ Duffy 1962, p. 101 (13-15 min.); Duffy was warden of San Quentin Prison for almost 12 years, during which time he conducted the execution of 88 men and 2 women, many of them executed in the local gas chamber.

⁶ Trombley 1992, p. 13 (approximately 10 minutes or more.); Amnesty International, *Botched Executions*, Fact Sheet December 1996, distributed by Amnesty International USA (more than 7 min). See also more recently Christianson 2010; this last book will be quoted more often in Section 7.1., where I will discuss this issue more thoroughly.

⁷ Re. the technical proceedings see Leuchter/Faurisson/Rudolf 2015, pp. 193-224.

⁸ Such is the title of a documentary movie directed by Errol Morris about Fred Leuchter, shown at the Sundance Film Festival in Park City (Utah, USA) on January 27, 1999 (see Morris 1999/2001/2003. The original version first shown on Jan. 27, 1999 during the Sundance Film Festivals was reworked after protests.

⁹ The following paragraphs were adapted from M. Weber 1998.



Figure 2: View into the execution gas chamber of the State Penitentiary in Florence, Arizona, USA.



Figure 3: Execution gas chamber of the State Penitentiary in Jefferson City, Missouri, USA.

A feature article in *The Atlantic Monthly* (Feb. 1990), for example, factually described Leuchter as

“the nation’s only commercial supplier of execution equipment. [...] A trained and accomplished engineer, he is versed in all types of execution equipment. He makes lethal-injection machines, gas chambers, and gallows, as well as electrocution systems [...]”

Similarly, a lengthy *New York Times* article (October 13, 1990), complete with a front-page photo of Leuchter, called him “The nation’s leading adviser on capital punishment.”

In his book about “America’s Capital Punishment Industry,” Stephen Trombley confirms that Leuchter is, in fact,

“America’s first and foremost supplier of execution hardware. His products include electric chairs, gas chambers, gallows, and lethal injection machines.

He offers design, construction, installation, staff training and maintenance.”
(Trombley, p. 8)

Killing someone in a gas chamber is very dangerous for those who carry out the execution, above all because the dead body of the victim is saturated with lethal gas. After the execution, explains Leuchter (*ibid.*, p. 98):

“You go in. The inmate has to be completely washed down with chlorine bleach or with ammonia. The poison exudes right out through his skin. And if you gave the body to an undertaker, you’d kill the undertaker. You’ve got to go in, you’ve got to completely wash the body.”

Bill Armontrout, warden of the Missouri State Penitentiary in Jefferson City, confirms the danger (*ibid.*, p. 102):

“One of the things that cyanide gas does, it goes in the pores of your skin. You hose the body down, see. You have to use rubber gloves, and you hose the body down to decontaminate it before you do anything [else]”

In Leuchter’s opinion, gas-chamber use should be discontinued, not just because of the cruelty of this method of execution, but because of his beliefs relating to gas chambers as such (*ibid.*, p. 13):

“They’re dangerous. They’re dangerous to the people who have to use them, and they’re dangerous for the witnesses. They ought to take all of them and cut them in half with a chain saw and get rid of them.”

With a career built on the motto “Capital punishment, not capital torture,” Leuchter took pride in his work. He was glad to be able to ensure that condemned prisoners die painlessly, that the personnel who carried out executions were not endangered, and that taxpayer dollars were saved.

1.2. Hydrogen Cyanide – a Dangerous Poison

Hydrogen cyanide, is not, of course, utilized solely for the purpose of executions in U.S. gas chambers, but for much more beneficial purposes as well. Since approximately the end of WWI, hydrogen cyanide, or HCN, has been used to exterminate vermin such as bedbugs, lice, corn weevils, termites, cockroaches, and other pests. It is, of course, important to be extremely cautious while applying hydrogen cyanide in order to avoid disaster, because it is in many ways a highly dangerous poison.

The residents of a house in Los Angeles, California, had to learn this in a quite painful way shortly before Christmas 1947. They had hired the Guarantee Fumigation Company to destroy the termites which threatened to eat up the wooden structure. The pest controllers, however, were apparently not very competent, because when using a container of pressurized HCN to fill the house, which had been wrapped up like a Christmas present, they exceeded

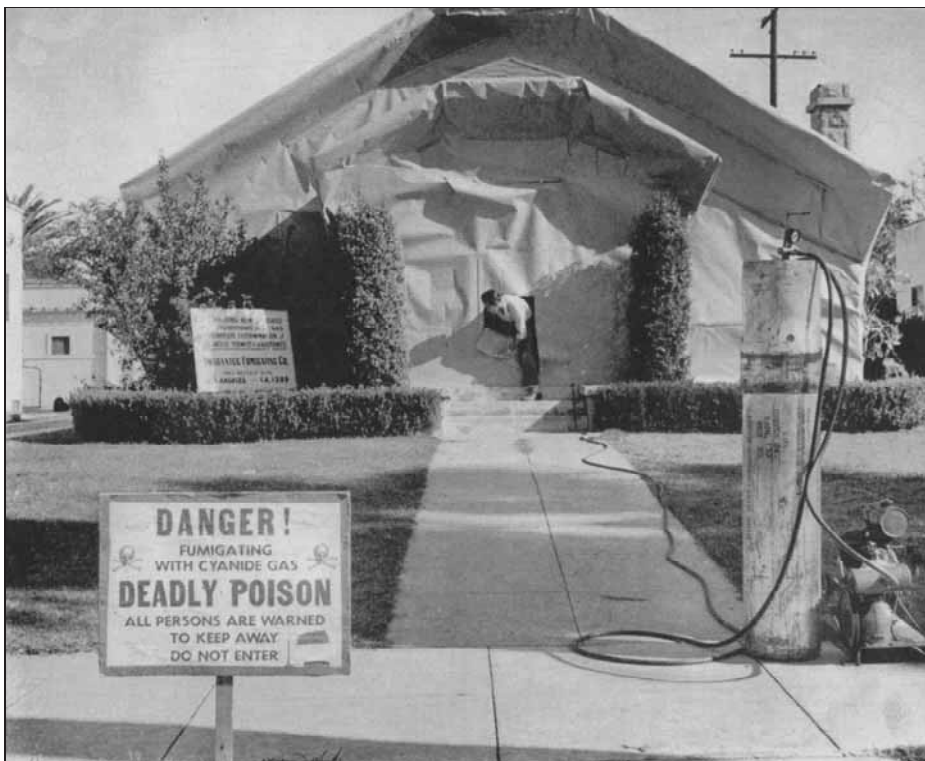


Figure 4: How to get rid of termites: A house wrapped up for disinfection with hydrogen cyanide. The gas is piped into the house from a pressurized bottle.

safe limits and pumped in too much gas. (Figure 4).¹⁰ Due to unknown reasons, the mixture of air and HCN, which can be highly explosive under certain circumstances, ignited during the fumigation. The resulting explosion destroyed the entire dwelling.¹¹

However, hydrogen cyanide has yet another insidious characteristic: it is highly mobile. This mobility is highly welcome when it comes to killing vermin: Wherever fleas and bugs try to hide, the gas will still reach them! Unfortunately, hydrogen cyanide does not restrict itself to attacking vermin. Rather, it indiscriminately seeps into the smallest cracks and even penetrates porous substances such as felt sealing materials and thin walls, thereby leaking into areas where it is not welcome. Failures on the part of disinfestors to ensure that all places to be fumigated are adequately sealed off have been described in toxicological literature (Moeschlin 1986, p. 300):

¹⁰ A gassing requires 1-2% by volume, while an explosion requires 6% by volume or more; see, in this regard, Section 6.3.

¹¹ "How to get rid of termites," *Life*, Dec. 22, 1947, p. 31; a much smaller accident occurred during an attempt to euthanize a cat, whose intense scratching on the execution-chamber walls created a spark that made the poison gas, which evidently had been administered in too high a concentration, explode. The cat escaped. The press did not report the kind of poison gas used, though ("Lethal Gas Chamber..." 1936).



Figure 5: How not to get rid of termites: The concentration of hydrogen cyanide used was too high. One single spark, and the entire house blew up.

“Example: *J.M.*, a 21-year-old female home decorator, was working in the basement of the house, the second floor of which was being treated for vermin with cyanide gas. Due to insufficient sealing during fumigation, the gas penetrated the corridors, where it poisoned the disinfestor, and reached the cellar through air shafts. *Mrs. M.* suddenly experienced an intense itching sensation in her throat followed by headache and dizziness. Her two fellow workers noticed the same symptoms and they all left the cellar. After half an hour, *Mrs. M.* returned to the cellar whereupon she suddenly collapsed and fell unconscious. *Mrs. M.* was taken to a hospital together with the unconscious exterminator. *Mrs. M.* recovered and was released. The exterminator, by contrast, was pronounced dead on arrival.”

The dangers of this type of poison gas are not merely restricted to persons in the same house in which fumigation is taking place. Large quantities of gas may penetrate the open air and endanger the entire neighborhood, as shown by an accident in the fall of 1995 in a Croatian holiday resort.¹²

¹² *DPA* 1995, p. 7. Research has failed to determine which toxic gas was involved. Since hydrogen cyanide is one of the most poisonous and most rapidly diffusing of all gases used in disinfestation, the reported damage would have been at least as great if caused by hydrogen



Figure 6: Church of the Holy Juraj (St. George) in Lovran, Croatia (Aconcagua, Wiki Commons)

“That failed profoundly. Three local residents suffering from symptoms of poisoning and a number of surviving woodworms were the results of the botched action against vermin in a church in the Croatian holiday resort of Lovran, close to Rijeka. The exterminator’s clumsy work necessitated the evacuation of several hundred residents of the locality.

The exterminators tried to treat the Church of the Holy Juraj for woodworms during the night, using the highly toxic gas. But since they failed to seal off the church appropriately, the gas seeped into surrounding houses in which people were already asleep. ‘Fortunately, the people woke up immediately because of

cyanide, even if hydrogen cyanide was not in fact involved in this accident. A number of additional examples are described by K. Naumann 1941.

sudden attacks of nausea – that’s what saved them from certain death,’ wrote the newspaper Vecernji List. Three residents nevertheless suffered severe intoxication. The mayor decided to evacuate the center of the town. The exterminators were arrested. The woodworms survived. dpa”

But that is still not all: on top of this, hydrogen cyanide is also a persistent poison. It adheres wherever it is utilized, especially in a moist environment. Deadly cyanide gas continues to evaporate slowly from moist objects for hours and days, involving a long-term environmental hazard where sufficient ventilation cannot be assured.

A 1935 case of accidental HCN poisoning in the USA highlights this. A residential home had been fumigated with HCN, and subsequently thoroughly ventilated for 24 hours. However, that wasn’t good enough, because the workmen hired to recondition the premises who entered the house right afterwards “complained of sickness during their work.”

This led to an extended scientific study, in the course of which several standard-size houses were fumigated with HCN and subsequently ventilated for 24 hours. After this, the HCN quantities remaining at various locations in these houses were measured meticulously. Some of these houses were furnished and filled with the usual personal property; others were unfurnished. One series of gassings occurred during the summer, the other during the winter. The results of these scientific experiments were published four years later and stated among other things (Page/Lubatti/Gloyns, p. 31):

“1. All windows should be kept open for 24 hr. unless this leads to the entry of rain or snow.

2. A ventilation period of 24 hr. is generally sufficient for an empty house of normal construction. A longer period may be required for a furnished house or for a house which (a) is damp, (b) contains an unusual proportion of dead space, (c) contains rooms without windows providing adequate communication with the open air.

(c) Precautions

1. Fumigation of clothing and particularly of bedding in a house, as a regular practice, is definitely undesirable.

2. Upholstered furniture should be placed in such a position as best to facilitate airing. Cushions, etc. should be spread out singly on furniture which is not upholstered. [...]

4. If the house contains a considerable quantity of absorbent material or if the fabric is likely to be unusually absorptive, e.g. if partitions of insulating board are employed, or if the construction of the house, or any other circumstances, suggest that a period of 24 hr. airing may not be sufficiently long, all doors and windows should be closed after performing the tests with benzidine acetate–copper acetate, and these tests should be repeated after the house has remained closed for 2 hr. This will allow absorbed gas to be given off and to

build up a concentration in the air space. If this is still not greater than [...] 0.0009 % by vol., reoccupation may be permitted."

Later in the present study, we will encounter moist rooms, chock-full of moist objects and without appropriate means of ventilation, which are said to have been filled with HCN.

The danger of lingering amounts of hydrogen cyanide is also emphasized by an especially dramatic and simultaneously macabre accident in the United States in the fall of 1998 (S. Ball 1998):

Los Angeles Times

Oct. 13, 1998 | STEVE BALL, TIMES STAFF WRITER

9 Hurt after Student's Apparent Suicide by Cyanide

Toxic fumes produced when a college student from Orange County died of an apparent suicide Monday forced the evacuation of an Iowa dormitory and the hospitalization of nine people, authorities said.

Carl T. Grimm, 20, a sophomore from Placentia, ingested potassium cyanide about 7:30 a.m. in his dormitory room at Grinnell College, a private liberal arts school about 50 miles east of Des Moines, Iowa, Grinnell Fire Chief Jerry Barns said.

Four paramedics who responded to the call at Younkers Hall came in contact with fumes from the poison, as did two college staff members and three other students.

Grimm was taken to Grinnell Regional Medical Center, where he was pronounced dead. [...]

The others who became ill on the Iowa campus were treated and released from the hospital. [...]

Firefighters sent to the dormitory evacuated the three-story structure until the Des Moines Hazardous Materials Unit arrived to ventilate the building.

Authorities could not say immediately where or how Grimm acquired the potassium cyanide.

Another case, which occurred somewhat differently, nevertheless led to an accident which was no less tragic. Salts of cyanide, which release cyanide gas in the presence of moisture, are used for the separation of gold and silver during the processing of precious metals. In the case in question, a company was engaged in the processing of the cyanide-rich residues of such chemical reactions contained in large tanks, which is not without risk. The employer irresponsibly directed the workers, who were not equipped with gas masks or

protective clothing, to go into the tanks, which were still releasing cyanide gas. The consequences were tragic:



Department of Justice

Department of Justice National News Release

MONDAY, MAY 10, 1999

On May 7, the jury in Pocatello, ID, found that Allan Elias ordered employees of Evergreen Resources, a fertilizer manufacturing company he owned, to enter and clean out a 25,000-gallon storage tank containing cyanide without taking required precautions to protect his employees. Occupational Safety and Health Administration inspectors repeatedly had warned Elias about the dangers of cyanide and explained the precautions he must take before sending his employees into the tank, such as testing for hazardous materials and giving workers protective gear.

Scott Dominguez, an Evergreen Resources employee, was overcome by hydrogen cyanide gas while cleaning the tank and sustained permanent brain damage as a result of cyanide poisoning. [...]

Over a period of two days in August 1996, Elias directed his employees – wearing only jeans and T-shirts – to enter an 11-foot-high, 36-foot-long storage tank and clean out cyanide waste from a mining operation he owned. Elias did not first test the material inside the tank for its toxicity, nor did he determine the amount of toxic gases present. After the first day of working inside the tank, several employees met with Elias and told him that working in the tank was giving them sore throats, which is an early symptom of exposure to hydrogen cyanide gas.

The employees asked Elias to test the air in the tank for toxic gases and bring them protective gear – which is required by OSHA and which was available to the defendant free of charge in this case. Elias did not provide the protective gear, and he ordered the employees to go back into the tank, falsely assuring them that he would get them the equipment they sought. Later that morning, Dominguez collapsed inside the tank. And he could not be rescued for nearly an hour because Elias also had not given employees the required rescue equipment.^[13]

Even this example fails to convey the full scope of the insidious nature of cyanide gas, since it does not just kill by means of inhalation; even a gas mask may prove insufficient, especially if a person is sweating heavily. Hydrogen cyanide is dissolved most readily on moist surfaces, and it easily penetrates

¹³ Occupational Safety & Health Administration, news release, May 10, 1999; Allan Elias was sentenced to 17 years in prison on April 28, 2000, www.justice.gov/archive/opa/pr/2000/April/239enrd.htm; an entire book has been written about the case: Hilldorfer/Dugoni 2004. The cyanide-contaminated sludge in the tank also contained phosphoric acid, resulting in the accelerated release of cyanide gas.

the skin. This was proven by a dramatic accident in 1995 in a cave in the French city of Montérolier (“Un expert...,” 1998):

“The death of nine persons on June 21, 1995, in the cave of Montérolier (Seine-Maritime) was said to have been caused by the release of cyanide gas originating from the poison gas used during the First World War, the so-called Vincennite. This was announced Wednesday by former Professor of Physical Chemistry Louis Soulié. [...] At a press conference in Buchy, he said that ‘neither the children nor the firemen rushing to the rescue – one of whom wore a gas mask – died of carbon monoxide poisoning.’

[...] ‘Even six days after their deaths, a cyanide concentration twice as high as the fatal dose was still observed in the victims’ blood.’

According to the professor’s remarks, the three children lit a fire in the cave and threw a Vincennite bomb found in the cave into the fire. The bomb exploded. The gas caused the deaths of three children, four firemen, the father of one of the children and an amateur spelunker.

According to Prof. Soulié, the deaths of the firemen looking for the children in the cave, including the fireman wearing a gas mask, were due to the fact that hydrogen cyanide dissolves in the sweat and penetrates the body through the skin, where it causes poisoning.”

Similar to this was a case in the late 1990s that occurred in the storage space of a Hong Kong company trading in industrial chemicals. Three small flasks containing a dilute solution of hydrogen cyanide had been left out in a room uncovered overnight. The next day, a 19-year old female employee who had been in the room for four hours was found unconscious on the floor. The owner of the company, a physicist, rescued the girl and returned to the room to open windows for ventilation. After having spent some 10 minutes in that room, he also entered into an intensive care unit due to severe dizziness. Both patients were discharged days later from the hospital.

Other victims of hydrogen-cyanide poisoning included the firemen called onto the scene. Four firemen, ranging in ages from 25 to 35, wearing a self-contained breathing apparatus along with the normal structural fire-fighter’s protective outfit, experienced mild symptoms of HCN poisoning after spending from 5 to 30 minutes in the affected room. Their symptoms included flushing, dizziness, headache, throat discomfort, chest tightness, and skin and eye irritation, and gave cause for them to be treated at the hospital. Another 50-year-old fireman wearing no such protective clothing or breathing apparatus, who stood 100 feet outside of the room in a corridor, developed chest discomfort, flushing, headache, and eye and skin itchiness, and had to be decontaminated at the hospital as well.

The authors describing the case concluded (Lam/Lau 2000):

“Rescuers should wear full protective clothing and SCBA [self-contained breathing apparatus] to avoid poisoning themselves during rescue attempts.

Because cyanide is readily absorbed from routes including the skin, mucous membranes, and by inhalation, structural firefighter's protective clothing is not ideal as the ears are exposed and the hydrogen cyanide gas diffuses through the fabrics. [...] in the animal study, hydrogen cyanide gas was absorbed through skin of dogs and guinea pigs and caused fatal outcomes. It is highly likely that the toxic symptoms in cases three to six [fire fighters inside room] are because of absorption of highly concentrated hydrogen cyanide gas through their intact skin. Therefore, firemen should wear special chemical protective clothing covering all parts of the body before entering the contaminated site. Case number 7 [fire fighters outside room] also alerts us to the extensiveness of cyanide gas's diffusion."

1.3. The Acid That Causes Blue Stains

Great excitement was caused by a strange occurrence in a Protestant church at Wiesenfeld, Upper Franconia, Germany, in the spring and summer of 1977. The congregation had renovated the deteriorating church at great expense during the previous year, but now they faced a disaster. Huge blue stains were found to have formed in all parts of the plastered interior of the church. The experts having renovated the church were now called in for consultation, and found themselves confronted by a riddle which was only solved by a chemical analysis of the stained portions of the walls. The entire interior surface of the church was impregnated by Iron Blue.¹⁴ No explanation could be found for this in the literature. It nevertheless proved possible to reconstruct the sequence of events.

A few weeks after the re-plastering of the church with a water-resistant cement mortar, the entire church had been fumigated with Zyklon B (hydrogen cyanide) to exterminate woodworms in the choir stalls. The hydrogen cyanide released by the Zyklon B did not just kill the woodworms: it also re-

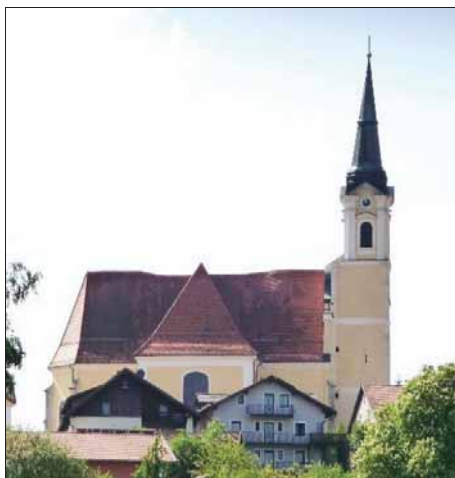


Figure 7: In 1972, the Catholic church in Untergriesbach, Bavaria, was fumigated with Zyklon B. Subsequently the entire plaster turned patchy blue (Konrad Lackerbeck; Wikipedia commons).

¹⁴ Iron Blue is the ISO term (ISO 2495) for iron cyanide blue pigments of various composition, which are also known as Berlin Blue, Turnbull's Blue, Prussian Blue, Vossen Blue[®], Milori Blue, Paris Blue, French Blue, China Blue, Bronze Blue, Steel Blue, Ink Blue, among others, and as ferric ferrocyanide.

acted chemically with the plaster. The hydrogen cyanide contained in the Zyklon reacted with the iron oxides contained in concentrations of 1-2% in all plasters, thus forming Iron Blue, a highly stable compound well known for centuries.¹⁵

Another case had occurred five years earlier in 1972 in the Catholic church of St. Michael in Untergriesbach, Bavaria. Here, too, the church had been recently refurbished with fresh plaster, which turned blue after the church had been gassed with Zyklon B to combat woodworms, just as it would happen in Wiesenfeld five years later.¹⁶

Reports of blue pigmentation of walls resulting from fumigation with hydrogen cyanide for the destruction of vermin in areas with moist, ferrous plaster are not unknown in technical literature, as shown by a recent survey.¹⁷ The prerequisite for this reaction ap-



Figure 8: In August 1976, the Protestant church at D-96484 Meeder-Wiesenfeld was fumigated with Zyklon B. Subsequently, blue-colored stains appeared all over the plaster (see Figure 9).

¹⁵ G. Zimmermann 1981, relating to the case of building damage occurring in August 1976 in the Protestant church at D-96484 Meeder-Wiesenfeld. I wish to thank Mr. W. Lüftl, Vienna, for discovering this information, as well as Mr. K. Fischer, Hochstadt am Main, who was held liable for damages as responsible architect, and who supplied me with further details. In English, with comments: G. Rudolf, "Wood Preservation through Fumigation with Hydrogen Cyanide: Blue Discoloration of Lime- and Cement-Based Interior Plaster," in: Rudolf 2003a, pp. 557-561.

¹⁶ www.pfarrei-untergriesbach.de/pfarrbrief11.htm.

¹⁷ Emmerling 1995. Whether the examples cited in the paper may perhaps refer to the above-mentioned case only in a roundabout way, must remain open for the time being. Carl Hermann Christmann reports the case of a farm building belonging to an 18th century monastery; the farm building was sold to a farmer following deconsecration, and the farmer then used it as a barn. Approximately 20 years ago, an investor converted the beautiful Baroque building into a luxury holiday restaurant. The existing interior plaster was repaired and painted white. After some time, blue stains appeared in the white paint; the stains were identified by a consulting expert as Iron Blue. The expert assumed that the former owner must have fumigated the building with hydrogen cyanide between 1920 and 1940, which then caused the stains 40-50 years later. Personal communication from C.H. Christmann according to his recollection on July 13, 1999; Mr. Christmann was unfortunately unable to relocate the source of the information. I would be extremely grateful for any references to passages in the literature in relation to this or any other similar case.

pears to be that the fumigated plaster must be new and must contain high humidity. In other cases, there was also damage to the structure and interior installations, but no blue stains, perhaps because the plaster was old and had already set.¹⁸

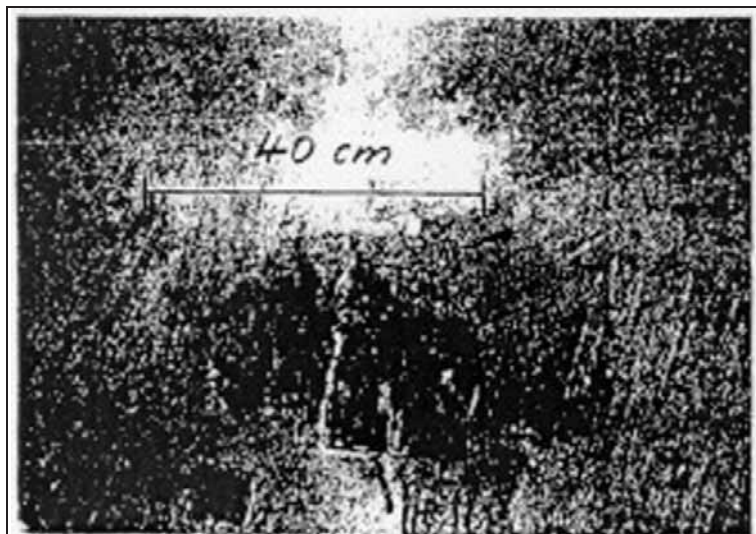


Figure 9: Inky blue stains on the plaster of a church fumigated with hydrogen cyanide (black and white only in G. Zimmermann 1981).

¹⁸ In one case, the fumigation of a church freshly painted with iron-free lime paint led to dark stains caused by the polymerization of hydrogen cyanide: Grosser/Roßmann 1974.