

The South African Chemical and Biological Warfare Program: An Overview

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In 1998, the South African Truth and Reconciliation Commission (TRC) held a public hearing into the chemical and biological warfare (CBW) program established under the auspices of the South African Defence Force (SADF) in the early 1980s. Witnesses who gave evidence at the hearing included scientists who had staffed the chemical and biological research and production facilities of the program; the former project officer, Dr. Wouter Basson; and the project manager and former surgeon general, Daniel (Niel) Knobel. This public hearing was a first of its kind in the world. Nowhere else had a government or military establishment been required to account openly and fully to the public for the development and daily activities of a national chemical and biological weapons program. A separate criminal trial of Dr. Basson, which is still underway as of this writing (September 2000), has produced additional information about the program.

At the TRC hearing, military documents were presented that described the nature of work that was done

as well as the management of the program. This article is based primarily on documents that were made available to the press and public during the official TRC hearings by the surgeon general of the military and others in their testimony, or have appeared as exhibits in the criminal trial of Dr. Wouter Basson. This article presents an overview of the South African CBW program as revealed through these documents, the testimony of witnesses at the hearing and in the trial, and interviews and other research conducted by the authors during a three-year investigation.

The article begins by presenting the official reasons given for the initiation of the program, which emphasized a need to counter a perceived threat that chemical weapons might be used against South African soldiers. The article then describes the nature of the program and its structure. Subsequent sections then provide more detail on the military chain of command, the recruitment of scientists, the nature of the products researched and developed, and the conduct of operations that were linked

to the CBW program. The article then summarizes the evidence revealed at the TRC of international collaboration with the program. A short analysis of the criminal trial of Basson concludes the overview. In sum, this review of information that has been made public shows that the South African CBW program was neither purely defensive nor oriented solely towards external threats. In addition, the information released to date suggests that weaknesses in the management of the program enabled Basson to take the program in directions that are unusually troubling even relative to other national CBW programs.

THE OFFICIAL JUSTIFICATION FOR THE PROGRAM

South African Defence Force officials have repeatedly stated that the South African CBW program was established to counter a threat of chemical weapons being used against their troops during the conflict in Angola, which lasted from the mid-1970s to the end of the 1980s. While that was the primary reason for the establishment of the CBW program, a secondary reason, to produce crowd control agents, was in practice given equal importance in the program.

In 1975, South Africa invaded Angola in an attempt to disrupt Angolan independence after it had been achieved during the previous year. South African troops were forced to withdraw after facing logistical problems and when confronted by large forces of Cuban soldiers acting in support of the Popular Movement of the Liberation of Angola (MPLA). The conflict in Angola continued in subsequent years, with South Africa arming and otherwise supporting the National Union for the Total Independence of Angola (UNITA) in the fight against the MPLA government. This war resulted in a number of conventional battles between the SADF and MPLA between 1980 and 1988.¹

During the period between 1975 and 1980, at the height of the conflict, South African troops confiscated vehicles from the Cuban soldiers deployed in Angola. These vehicles were taken to a South African military base in Namibia, where it was found that they were fitted with air filters as well as with medical bags containing nerve gas antidotes and gas masks. According to the evidence of the project manager and surgeon general, General Daniel Knobel, this finding led the SADF to believe that Cuban troops intended to use chemical agents. General Knobel said the SADF felt the threat

against South Africa was so great that its troops had to be protected at all costs, even if this meant having to buy the necessary items on the international black market “or to steal technology.”²

At the same time as South African troops were engaged in battle in Angola, the domestic situation had become critical. The apartheid government policies, under the leadership of Prime Minister B.J. Vorster, had resulted in deteriorating and increasingly overcrowded urban environments, poor economic growth, and a discriminatory educational system. Combined with an increasingly assertive liberation movement, within the country and in exile, a potentially explosive mix was beginning to develop by the mid-1970s.

In 1976, students in Soweto, a township in Johannesburg, protested against the compulsory teaching of Afrikaans in schools. Police used live ammunition to suppress the protests, resulting in the death of school children. According to the head of the Defence Force at the time, General Constand Viljoen, these deaths led to a diplomatic setback for South Africa and such a situation had to be prevented in the future. This goal “focussed the attention of the military on the need to develop alternative crowd control agents.”³

More generally, the 1976 Soweto uprising exposed and heightened the contradictions and tensions in the political system.⁴ Given the combined external and internal problems confronting the apartheid regime, the minister of defence at the time, P.W. Botha, argued in a 1977 Defence White Paper that the country was faced with a “total onslaught” that required a “total strategy.” This was to involve “all the means available to the state of the military, economic, psychological, political, sociological, diplomatic, cultural and ideological fields of state activity.” There would, he maintained, need to be a combination of “effective security measures with reformist policies aimed at removing the grievances that revolutionaries could exploit.”⁵

A year later, in 1978, P.W. Botha replaced B.J. Vorster as prime minister, bringing in with him a National Security Management System that sought to coordinate all activities of state departments within the “total strategy.” Security forces were now instructed to deal with internal conflict situations in a more efficient manner than they had previously.

When the chief of the SADF and a small group representing the Defence Council approached the minister of

defence in the beginning of 1981 with these multiple security issues, they were instructed to find a solution to the problems. As a consequence, Brigadier Wouter Basson, a young military doctor, was ordered by the Defence Council to travel abroad in 1981 secretly to collect information about the CBW programs of the West. Basson was to use these models as the basis for developing the blueprint for a South African program. He was specifically instructed to make contact with organizations that might provide information about the CBW capabilities of Eastern Bloc countries.⁶

In August 1981, additional funds were allocated by the chief of the defence force, General Viljoen, to complete a feasibility study for the establishment of a CBW program in South Africa. Toward the end of 1981, the minister of defence officially approved the establishment of a CBW program, and funds were made available for that purpose. It was initially envisaged that the state-owned arms manufacturer ARMSCOR would assist the SADF in developing the program. However, in a meeting with the surgeon general at the time, N.J. Nieuwoudt, ARMSCOR officials pointed out that it would be too sensitive a task for the arms manufacturer. It was decided accordingly that the SADF should be solely responsible for the project.⁷ This was subsequently approved by the minister of defence, who also approved a management committee, the Coordinating Management Committee (CMC). The CMC comprised the chief of the SADF, the surgeon general, the chief of staff for finance, the chief of staff for intelligence, and other co-opted members. Its function was to oversee the program, code-named Project Coast.⁸

When Basson returned from his information-gathering trip in 1981, he reported to the Defence Council. He told the council that chemical and biological warfare programs in other countries were structured in such a way that “offensive”⁹ research and development were conducted by civilian fronts, up to the point of weaponization.¹⁰ Weaponization, he reported, took place in top-secret military laboratories. Although this was not an accurate description of how Western programs were structured at the time (since the development of chemical weapons took place within the structures of their militaries), it was on the basis of this information that the operation of the South African program was determined.

THE NATURE OF THE PROGRAM: OFFENSIVE CAPABILITIES WERE SOUGHT

South African military planners showed little regard for the international conventions regulating chemical and biological warfare. Indeed, development of a biological warfare facility to produce pathogens was a clear violation of the Biological and Toxin Weapons Convention (BTWC) that had been ratified by the South African government on November 3, 1975. It is now clear that the CBW program’s goals included the creation of weapons that could be used in offensive operations.

The aim of Project Coast, as described in military documents, was to “do research and development in a covert and clandestine manner, establish production technology in the critical and sensitive areas of chemical and biological warfare, and to provide the South African security forces with a CBW capacity in accordance with the CBW philosophy and strategy.”¹¹ The project was to establish a research and development program and a production capacity “with regard to both chemical and biological warfare.” The documents also refer to the need for an industrial capacity.

Other official military documents that have been made public provide further insight into the project’s objectives. The project officer, Basson, explained the aims of the project, in a document used as an exhibit in his criminal trial, as follows:

- “Research with regards to the basic aspects of chemical warfare (offensive).”
- “Research with regard to the basic aspects of biological warfare (offensive).”
- “Research with regard to offensive systems, both covert and conventional.”
- “The creation of an industrial capability with regard to the production of offensive and defensive CBW equipment. In this regard, the project provides access to the basic technology through acting as a middleman between the local and overseas companies.”
- “Support to CBW operations (offensive and defensive) through the export of security forces. This is usually divided into two sections:

Conventional: this support usually includes distribution of equipment (offensive and defensive) which is not yet authorized for use in terms of standard procedures. This includes the storage of equipment.

Covert: This support is provided to the Commanding Officer Special Forces and his organizations, Chief of Staff Intelligence and his organizations, the South

African Police and National Intelligence. This service includes the preparation of equipment, training in the use thereof, transport thereof as well as support during use.”

- “The conduct of [our] own CBW operations. This is carried out in a similar way to covert support except that [our] own operators are used as a result of access and other circumstances.”¹²

Documents such as this cast doubt on claims by the project manager, Niel Knobel, that no offensive capabilities were sought. General Knobel told the TRC hearing:

[It] was spelt out very clearly that in this project we would not embark on creating an offensive capability with classical lethal chemical weapons and therefore I can declare quite emphatically to you that at no time were classical chemical, or for that matter, biological weapons developed, [or] weaponized with delivery systems, and there was no intent ever to use any of those weapons on the battlefield. The philosophy allowed us to consider a second category, namely incapacitating agents and a third category, namely irritating agents.¹³

Knobel’s suggestion that lethal chemical weapons are the only category of “chemical weapons” is misleading, as non-lethal agents can also be employed as weapons. More important therefore is his admission that irritating and incapacitating weapons were considered and indeed weaponized. This occurred, for example, with the irritating agent CR, a riot control agent that is more potent but less toxic than CS, the tear gas in most common use around the world. Knobel said CR would have been considered for use as a weapon in retaliation for a chemical attack, consistent with the terms of the 1925 Geneva Protocol. During the criminal trial of Basson, it was revealed that between 1987 and 1994 an ARMSCOR subsidiary, Swartklip Products, loaded CR powder into 11,966 hand grenades, into rifle grenades, into 81-millimeter (mm) mortar bombs, and into 1,373 155-mm artillery shells intended for use in the G5 system, which has a range of up to 40 kilometers.¹⁴

In referring to biological agents, General Knobel stated that “at no stage was it ever considered to develop a biological warfare offensive capability.... [T]herefore all the organisms and toxins that were studied were never considered either for weaponization or for delivery systems and there was no intent ever to use them.”¹⁵ Again,

his statement contradicts the aims of the program, which included the intentions to develop both a research and development capability and a production capacity.

Knobel’s statement is also contradicted by a list of products “sold” by the biological research and production facility, Roodeplaat Research Laboratories (RRL), to police and military operators. This list, found in Basson’s trunks at the time of his arrest in 1997, became known as the “Verkope Lys”¹⁶ (Sales List). It included cigarettes contaminated with anthrax and household items contaminated with organophosphates, as well as other items identified as assassination weapons by General Knobel at the TRC hearing. Although no evidence of large-scale production of biological agents or weapons was found at RRL (as opposed to Delta G Scientific, where there was such large-scale production of chemical agents), there were sufficient quantities of cholera and other bacteria to have caused epidemics in communities, as well as the death of individuals.¹⁷

The disregard of the Defence Force for the provisions of the BTWC is clearly reflected in a document authored by Basson in 1991, signed by the then chief of the defence force, General A.J. Liebenberg, the minister of defence, Magnus Malan, and the minister of finance, B.J. du Plessis. In describing the process of privatization of the biological warfare facility, the document states:

It is also often difficult for the scientists of RRL (who are not trained to think strategically) to keep perspective in the light of the renewal of western attempts to ban chemical and biological weapons. It appears to them as if the RSA will have to accede to this call. *The fact that none of the involved countries are thinking of distancing themselves from biological weapons is not clear to them.*¹⁸

ORGANIZATIONAL STRUCTURE OF PROJECT COAST: DESIGNED TO PRESERVE SECRECY

Project Coast was established in such a way as to make it difficult, if not impossible, for observers to link the CBW facilities to the military. The facilities were established as front companies that would appear to be private concerns. In reality, they were reliant on military contracts for their survival.

The first managing director of RRL, Dr. Adriaan Goosen, explained in his evidence to the TRC that the

establishment of front companies allowed scientists free access to the international scientific community and enabled the facility to attract top scientists, since military remuneration would not have been sufficiently attractive.¹⁹ Front companies also made it possible for the program to procure substances that the military unit could not.

The blueprint for the South African CBW program included initial establishment of a biological research, development, and production facility, Roodeplaat Research Laboratories (established November 1982); a chemical research, development, and production facility, Delta G Scientific (established April 1982); and an administrative and financial management front company, Infladel (established June 1984). The latter was intended to channel funds from secret defense account to the facilities. Between 1984 and 1989, Infladel played the role of financial conduit and administrative headquarters. In 1989, the company was divided into two, one to deal with the administration of the project and the other responsible for financial management. In this arrangement, D. John Truter Financial Consultants and Sefmed Information Services came into being.²⁰

From the start of these arrangements in April 1982 it was envisaged that the program would have three stages:²¹

- Phase 1: the establishment phase (April 1982 to March 1988). This involved the establishment of the front companies and production facilities, Delta G Scientific, Roodeplaat Research Laboratories, and Infladel.
- Phase 2: the commercialization phase (March 1988 to April 1990). During this phase representations were made to the CMC regarding privatization of the front companies. The balance sheets were restructured to create manageable commercial packages. The latter were completed by September 1988.
- Phase 3: the privatization phase (April 1990 to September 1991). This phase saw the cancellation of all research contracts with the front companies. On August 30, 1991, the front companies were “sold” to the management and workers at Delta G and RRL. In September 1991, a submission was made to a parliamentary committee that included the minister of finance and three other cabinet ministers.²²

A fourth phase, known as the “normalization phase,” was to have taken place between September 1991 and 1993. This phase was considered once the SADF knew

that the Chemical Weapons Convention was to be signed on January 14, 1993. The normalization phase saw completion of production of two new incapacitants. Emphasis was placed on crowd control methods.²³

According to this plan, it was envisaged that the project would run for eight years, from 1982 to 1990, when privatization was to have taken place. In fact, the program continued for longer, as the alleged destruction of chemicals produced and procured by the program only took place in January 1993.

THE CHAIN OF COMMAND OF PROJECT COAST: HOW LIMITED WAS OVERSIGHT OF THE PROGRAM?

Evidence presented at the TRC hearing in 1998 and at the trial of Basson in 1999 and 2000 by the former surgeon general, General Knobel, and by other officials associated with the program indicated that despite the existence of the Coordinating Management Committee to supervise Project Coast, Wouter Basson was the only person who knew the details of the program. Knobel stated that the CMC did not want to know which individuals or countries Basson dealt with, or details of foreign bank accounts used. The important thing was that foreign agents and suppliers were never to know the SADF was involved.²⁴ The auditor of the front companies, Petro Theron, reiterated in his testimony during the criminal trial of Basson that Basson was the only person who knew what substances the project was to procure, how much they cost, and whether and how they were used.

Basson’s defense advocate has argued that the CMC did not want to know what he was doing.²⁵ Whether this portrait of Basson’s activities not being monitored is a true reflection of the management of the project or is instead an attempt to prevent people higher up the military and political chain of command from being implicated in the criminal charges against Basson cannot be answered at this time. Information released publicly does make it possible to describe the formal chain of command of Project Coast and the structures responsible for its management.

The Coordinating Management Committee, established on the authorization of the minister of defence, was ultimately responsible for the chemical and biological warfare program. Besides the chief of the SADF, surgeon general, and chiefs of staff for finance and in-

*Chronology of Project Coast***1971**

April 10: South Africa becomes a signatory to the Biological and Toxin Weapons Convention (BTWC).

1975

November 3: South Africa deposits the instrument of ratification of the BTWC.

1981

Minister of Defence approves the establishment of Project Coast.

1982

Establishment of Delta G Scientific and Roodeplaat Research Laboratories, the front company facilities of Project Coast for chemical and biological research, respectively.

1988

Delta G Scientific produces a large quantity of methaqualone.

1989

Project Coast has produced 20 tons of CR, of which 10 tons were used by the army to fill munitions.

Head of research at RRL prepares a list of biological agents formulated for application; these agents were provided to members of the South African Police and SADF.

1990

February: Unbanning of the ANC and other political parties and organizations opposed to apartheid.

March: President de Klerk orders that no lethal chemical agents should be produced by Project Coast.

October: The Defence Council decides that research and weaponization of CR, BZ, MDMA, and methaqualone derivative should go ahead.

1992

October: The Coordinating Management Committee approves the speeding up of all international procurement activities in anticipation of the signing of the new Chemical Weapons Convention.

1993

January 14: Signing of the Chemical Weapons Convention.

January 23: Alleged destruction of drugs and chemical agents produced by Project Coast.

February: Final delivery of MDMA from Delta G Scientific to Basson.

1997

January: Basson arrested, in possession of a quantity of MDMA.

December: Truth and Reconciliation Commission investigation into Project Coast begins.

1998

June: TRC holds hearings on CBW.

1999

October: Criminal trial of Wouter Basson begins in the Pretoria High Court.

telligence, members of ARMSCOR and, at some stages, representatives of the auditor general also took part in meetings when required. As project officer, Basson acted as secretary to the CMC. In that role he was responsible for all the documentation dealt with by the CMC, and he was the direct link to the front companies. According to Knobel, this also included responsibility for the companies.²⁶

The information about the project that was made available to the CMC related to the achievement of objectives that had been formulated and approved by the CMC in broad guidelines. According to Knobel, the members of the committee did not have either the scientific knowledge or background to deal with the detail of projects. The CMC would, for example, have been told: "we have now completed our investigations into all irritating agents or into all the classical chemical weapons or into this particular category of the classical chemical weapon." Knobel also said that "there was never an opportunity to really discuss in detail what particular experiments were carried out about the very vast numbers of chemicals that had to be studied."²⁷

General Knobel explained that the process of authorization would work along these lines:

The Co-ordinating Management Committee would approve a study of all the classical chemical agents which are known as schedule one chemicals, that would be the broad guideline given.... The project officer [Basson] would then say: 'We are now embarking on the classical lethal chemical weapons. We're going to study 500 different chemicals.' The Co-ordinating Management Committee would then say: 'Right, what sort of requirements do you have to be able to fulfil that objective, namely to look at all the classical lethal chemical weapons' and the Technical Work Group would then go and do an estimate of what experimentation would be required, what kind of staff would be required to do that work, what kind of laboratory you would have and so on. They would translate it into budgetary terms and would come back to the Co-ordinating Management Committee and say: 'If we want to do this and we want to deal with the classical ones during this year, we are going to require....'²⁸

The CMC was divided into working groups including a Financial Working Group, a Technical Working Group (TWG), and a working group responsible for the security of the project. The TWG, which included the project officer, the managing directors of the front companies, and the scientists within those companies, was intended to do the scientific research planning for each company. However, it emerged in court on November 30, 1999, that the group was a fluid concept. The only constant member was Basson. Other members of the TWG varied from one meeting to the next, depending on the needs of the specific scientists. According to testimony in court, the reason for this loose arrangement was that scientists working on one sub-project were not supposed to know what their colleagues were researching. So whenever the TWG met, the scientist(s) with a specific need would meet with Basson and, usually, the managing director of the front company and spell out what was needed and why. The intention was then for this information to be taken to the CMC by Basson for approval of expenditure.²⁹ In reality, scientists at RRL have told the authors, meetings with Basson seldom took place. Scientists testifying in the criminal trial have denied any knowledge of the existence of this structure.

The General Administration and Financial Committee, which included the surgeon general and the chief of staff for finance, was responsible for budgetary planning. After 1990, the chief of staff of the Defence Command Council became the chairman of the CMC, and financial and budgetary planning were done there.

Changes, promotions, and deaths resulted in a lack of continuity within the CMC. This aside, the structure could not have been an effective mechanism for maintaining control over the program since it only met on an annual basis. After 1981, the CMC only met for budgetary purposes. Basson was expected to brief the chief of the defence force, chief of staff for finance, chief of staff for intelligence, and the surgeon general on a more regular basis, although the frequency and level of detail of these meetings is not known. In other words, Basson was relied upon to keep the project running and to ensure that the objectives were met. Basson stated in his testimony during his application for bail that there would often be two or three months when he would not see Knobel at all and would take orders from the chief of staff for intelligence or the commander of special forces. He would never inform the surgeon general of these operational orders. From time to time, he also received

operational instructions from the security police. These instructions were likewise not reported.³⁰

While the CMC was responsible for the overall management of the project, the Defence Council was also kept informed of developments in the project, at least in terms of the SADF philosophy and strategy in relation to chemical warfare.³¹ The minister of defence was also kept informed of all major developments. The president of the country was at least aware of the program and ultimately responsible for curtailing or increasing its scope.³² Basson was not solely responsible for the development and conduct of the program; responsibility undoubtedly was shared with those who held military and political power.

RECRUITMENT OF SCIENTISTS

Scientists recruited to the CBW facilities were offered high salaries and an opportunity to spend a substantial proportion of their time doing their own work. This attracted many of the scientists, who also believed that the country was essentially at war and that they were thus also doing their patriotic duty. Before scientists were recruited, however, suitable candidates first had to be identified.

Dr. Basson told the TRC that the CMC instructed him to identify scientists he thought might be capable of making a contribution to the program. Once the key scientists had been identified and approved by the CMC, further recruitment was a responsibility shared by Basson and the scientists who had already been appointed.³³

In 1981, Dr. Daan Goosen was director of the HA Grové Animal Research Centre, which was the medical research facility for the University of Pretoria's medical faculty. He was at the same time special advisor to the office of the surgeon general with regard to veterinary matters. Goosen told the TRC that he had been involved in a committee doing research for the military and that other scientists working in civilian institutions, including the University of Pretoria Faculty of Veterinary Science and the HA Grové Animal Research Centre, were involved in similar research. Goosen said it was understood by the directors of such research facilities that money would be spent on military projects. In return, the military would assign national servicemen qualified as microbiologists, geneticists, veterinarians, and so forth, to work in the research facilities.³⁴

Goosen met Basson through his interaction with the surgeon general and had discussions about chemical and biological weapons with Basson. In the early 1980s, Goosen was asked by Basson to supply him with snake venom. This he did, also supplying him with a live snake.³⁵ This exchange established a trusting relationship between the two men, and in 1983 Goosen was asked to establish a facility for the South African Defence Force, to test chemical and biological products. One of his tasks was to recruit scientists to staff the facility. Many of the scientists who were recruited by Goosen had previously been employed at academic institutions, particularly the University of Pretoria.

The recruitment of researchers for the chemical facility, Delta G Scientific, took place in a similar way. Scientists were identified by Basson, and they in turn recruited colleagues. In addition, conscripts with appropriate qualifications were also co-opted, as were doctors from Special Forces. There are no statistics available to indicate the number of conscripts who worked at the CBW facilities; it would appear to be a small number.

Between April 1986 and 1997, there were 120 employees at Delta G Scientific. Technical professional personnel at RRL, not including assistants, cleaners and maintenance staff, numbered approximately 43.³⁶

Although not everyone recruited was fully aware of the role of the front companies in developing a CBW capability, all were required to sign documents swearing them to secrecy. This alerted most to involvement of the military.

A number of scientists were asked during the TRC hearings about their reasons for pursuing scientific research in fields they knew would be used to cause harm. Dr. Johan Koekemoer, an organic chemist formerly employed by Delta G Scientific who later headed the research department of the company, told the TRC that he regarded his work as essential to the defense of the country and that it was “no different from the work conducted at Porton Down and Edgewood Arsenal [chem/bio research institutes for the British and US militaries, respectively].” He did, however, express misgivings about the production of 912 kilograms (kg) of MDMA (more commonly known as the rave drug “ecstasy”) between 1992 and 1993. Koekemoer told the TRC that he believed that ecstasy was not an appropriate incapacitant, but that he had been subjected to tremendous pres-

sure from Philip Mijburgh (who was managing director of Delta G and a medical doctor) and Wouter Basson.³⁷

It became clear during the TRC hearing that the scientists believed that South Africa was at war and under threat of CBW attack. Most of them overtly or tacitly supported the racist ideology of the apartheid state and saw nothing wrong with their involvement in the CBW program. When, as some did, they came to see ethical problems with their work, they justified their continued involvement on the basis that they needed the jobs.³⁸ Scientists said that Basson had told them they were free of guilt, just as a gun dealer cannot be held responsible if the person who buys a revolver acts irresponsibly with the weapon.³⁹

PRODUCTS WITH NO DEFENSIVE PURPOSE

Despite the claim that the CBW program was intended to produce agents that could be used to retaliate against foreign forces in the event of a chemical attack on South African troops, RRL researchers also produced toxins and pathogens better suited to assassinating individuals or undermining the health of communities. The program scientists have said that their work was conducted under a veil of secrecy. They worked on a “need-to-know” basis, and they often did not know what became of the results of their work.⁴⁰ This secrecy and compartmentalization made it less likely that the individuals involved would know when the overall program breached their sense of ethical limits.

Scientists previously employed at RRL told the TRC that there were three categories of work done at RRL: “hard projects,” which were for the military; “soft” or commercial projects; and “in-house” projects. Documents made available to the TRC included a list of research projects for the military initiated at RRL in 1985, 1986, and from 1990 onward. Dr. Schalk van Rensburg, discussing this list at the hearing, pointed out that of the 163 projects listed, “66 percent concerned potentially lethal toxins.... Most were toxicity studies in animals followed by studies in which toxins were actually prepared.... Only 6 percent of these toxic studies involved treatment and neutralizing agents, only 6 percent of the 66 percent.”⁴¹

At least some of these toxins were apparently intended to be used to assassinate the apartheid regime’s enemies (the next section discusses these operations). Dr. Daan Goosen told the TRC on June 11, 1998, that even before

he became the head of RRL he had provided Dr. Basson with substances that could have been used to eliminate enemies of the state. Goosen also stated that one of the requirements of the toxins produced at RRL was that they should be either undetectable or else untraceable *post mortem*.⁴²

The list of projects discussed by van Rensburg included one research effort that has provoked particular controversy. According to van Rensburg, "Fertility and fertility control studies comprised 18 percent of all projects."⁴³ Both Goosen and van Rensburg testified that they understood that the purpose of the fertility project, in the view of the military, was to prepare a contraceptive for women that could be administered selectively and in such a way that the recipient would not know that she was taking it. Van Rensburg, who was technical advisor to the research project, said he had received the initial instruction to conduct the work from Basson, and he had been told that the purpose was to prepare a contraceptive that could be given to women fighting for UNITA in Angola. Although van Rensburg was skeptical of the reasons given by Basson, he was aware that the World Health Organization supported research into contraceptives and that there was a possibility of the project making money for RRL. He estimated that there was little chance of the research producing positive results for at least 10 years and therefore it was unlikely to be abused by the military in the short term. Press reports at the time of the TRC hearing stated (incorrectly) that an anti-fertility vaccine that would only work on black women was produced. By the time RRL was privatized, the research had not yielded a usable end product.⁴⁴

The discovery of the "Verkope Lys" (Sales List) among the documents seized at the time of Basson's arrest provided unique insight into the work conducted at RRL. This document was written by veterinarian Dr. André Immelman, director of research on SADF projects at RRL. According to Dr. Immelman, Basson introduced him to several individuals identified only by code names, and requested that Immelman provide these individuals with toxins. Three of these people were subsequently identified as members of the South African Police.⁴⁵ The items provided, according to the list, include anthrax in cigarettes, botulinum in milk, and paraoxon in whiskey⁴⁶—items that were potential murder weapons in the context in which they were being produced. This was confirmed by witnesses at the TRC hearing.⁴⁷ Dr. Knobel

went so far as to say that such activity would not form part of a legitimate defensive program.

THE USE OF TOXINS IN COVERT OPERATIONS

The indictment of Basson links him to operations conducted by Defence Force covert units under the names of Operation Barnacle and the Civil Co-operation Bureau. These units had as their primary objective the murder of people identified as enemies of the state.⁴⁸

According to Defence Force operators who testified at the Basson trial, Operation Barnacle was established in the early 1980s, when it came under the command of Special Forces. Its operators were mainly drawn from the former Rhodesian security forces, whose experience was sought by the SADF. According to exhibits handed to the court, the primary goal of Operation Barnacle was clandestine elimination of enemies of the South African state. The use of toxins played an important role in the covert assassinations carried out.⁴⁹

Evidence was presented in court that Operation Barnacle operators had been responsible for large-scale elimination of members of the South West African People's Organization (SWAPO) in Namibia. One operator, Johan Theron, claimed to have been responsible himself for murder of hundreds of SWAPO prisoners of war as well as South African Defence Force soldiers identified as security risks. Theron said that, on the advice of Basson, he had injected his victims with overdoses of the muscle relaxants tubarine and scoline. This, he understood, would have resulted in their death by suffocation. Bodies, he said, were thrown from an aircraft into the sea.⁵⁰

By 1985, the activities of Operation Barnacle had been taken over by the Civil Co-operation Bureau (CCB). Like Operation Barnacle, the CCB made frequent use of toxins in eliminating their targets. These reportedly included members and supporters of the African National Congress (ANC), sympathizers of the South African Communist Party, members of the United Democratic Front, individuals in the South African Council of Churches and its associated organizations, SWAPO supporters and sympathizers, "own forces" members who had threatened to reveal the workings of Special Forces, and other organizations and individuals who had criticized the government of the day.⁵¹

Toxins used by operatives of the CCB were initially acquired at the request of the head of CCB. Subsequently, medical coordinators were appointed to take over this function. The prosecutors in the Basson trial have suggested that the items on the Sales List were intended for use by members of the CCB.

BRINGING THE PROGRAM TO CONCLUSION

In February 1990, President F.W. de Klerk announced the unbanning of the African National Congress, the South African Communist Party, and 17 other previously banned organizations. This began a process that made possible negotiations leading to the first democratic elections in South Africa in 1994. On March 26, 1990, de Klerk ordered that lethal agents should not be further produced by the CBW program. He allowed that irritating and incapacitating weapons might continue to be developed and produced for use in a conventional manner.⁵² The Defence Council decided on October 25, 1990, that the research, development, and weaponization of one kind of irritant and three kinds of incapacitant should go ahead.⁵³ The minister of defence was informed in 1993 that in line with this directive the following chemical substances were produced: CR; a local BZ variant (BZ is a psychoactive incapacitant); a local methaqualone derivative (methaqualone is a sedative called “mandrax” in South Africa but better known in the West as “quaaludes”); and MDMA.⁵⁴

Despite the political changes underway in South Africa and the relative stability that had developed in the neighboring states, on October 31, 1992, the Coordinating Management Committee of Project Coast noted that the signing of the recently negotiated Chemical Weapons Convention would possibly “hamper local and international activities,” and procurement necessary for the project in 1993 might become very difficult. The CMC decided to conclude any procurement activities “necessary for the completion of the offensive project, that was [sic] dependent on international involvement.”⁵⁵

In anticipation of South Africa signing the CWC, on January 11, 1993, in response to a recommendation by Knobel, the minister of defence gave instruction that all incapacitating agents, including starter chemicals, should be destroyed.⁵⁶ The minister was advised that in light of the imminent signing of the CWC there were a number of options in relation to what should be done with the chemical substances produced or procured by the program. He was advised that 1,000 kg of BZ that had been

produced for weaponization in 1993 were on the list of prohibited chemicals and would either have to be destroyed or declared. The minister was informed that the CR that had been produced and weaponized in the form of smoke grenades fell into the category of substances that should “probably be declared but which it could be argued that our interpretation was that it did not have to be declared.”⁵⁷ The minister of defence was finally advised not to declare the new generation of tear gas (a CR analogue) being developed and to allow work to continue until the weaponization of the liquid form and formulation of the foam form had been completed. The minister signed acceptance of this course of action on January 11, 1993.⁵⁸

Despite the directive of the minister, it is reported in the document “Chronology of Incidents with Regard to the Croatian Transactions”⁵⁹ that the CMC decided to accelerate the CBW program. To this end R6.6 million were made available in February 1993 for the purchase of starter chemicals from Croatia. This document was given to the auditor general to explain the expenditure of project funds on the alleged procurement of 500 kg of methaqualone (the very methaqualone that was allegedly destroyed in January of the same year). These contradictions raise questions about the destruction of the chemical substances, which according to the documents handed to the TRC took place on January 27, 1993.⁶⁰

INTERNATIONAL ASSISTANCE

South Africa would have been unable to develop a CBW program had it not received some measure of international support. No evidence has emerged at the TRC hearing, or in the trial of Basson, to implicate any country in overtly supporting Project Coast. There is, however, no dispute that Basson traveled extensively during his tenure as project officer, collecting information and conducting business deals. Available information indicates that foreign nationals, “recruited” by Basson, laundered money through their accounts. They may also have assisted Project Coast in procuring sensitive items.

There is little information available about Basson’s initial information-gathering trips in 1981 besides two documents found in the seized trunks. A handwritten report authored by Basson in May 1981 describes a congress he attended in San Antonio, Texas, and there is an itinerary for a visit to Taiwan to view their CBW facilities in the same year.⁶¹

The South African program ultimately did not reflect the structure or nature of the US or Taiwanese programs. Further details about Basson's travels are revealed in the documents found in his trunks. These relate to trips undertaken some years later.

Basson's bail application hearing provided an insight into his extensive international network. In 1997, he told the Office for Serious Economic Offences, during his application for bail, that he had had many international contacts including agents from foreign intelligence services. Particular mention was made of contacts named in the bail application in the Danish, Swiss, and British intelligence services. Basson told the court that he had negotiated for the procurement of equipment, notably a peptide synthesizer, with an East German agent. He claimed also to have had contact with GRD, the Swiss air force procurement organization, which Basson said that he, Jurg Jacomet, a Swiss national who was involved in arms dealing, and Derek Griffith, a British national, had visited on occasion.

Basson also told the court that he had spent up to four weeks at the Russian Academy of Sciences in Moscow. There he claims to have met many "good scientists who were helpful in the work that I did."⁶² No other evidence has been provided to support this statement. General Knobel, in his explanation of the Croatian transactions in 1992 and 1993, states: "[A]fter a visit by the project officer to Moscow in February 1991, the project officer was introduced to a number of people who work or worked in the field of chemical warfare, amongst these was a group in Croatia."⁶³

A document prepared by Commandant R. Louw in August 1988 reports on a trip undertaken by SADF and ARMSCOR personnel, accompanied by Uwe Paschke, son-in-law of former President P.W. Botha and representative of the company PATECH, to Israel and West Germany in that year. In summary, it said of that visit:

1. It provided for personal contact with experts in the field of CBW and the establishment of relationships which can be followed up.
2. Access was gained to industries which were formerly inaccessible.
3. A basis was laid for possible co-operation with Israel's [MOD] in the field of CBW.
4. A wider insight [was gained] with regard to philosophy and key problem areas.
5. [It c]onfirmed that although SA is still in the early stages, the program is fundamentally

sound and up to date with the latest developments.

6. Confidence was built and the SADF was acknowledged as a partner in the field of defensive CBW, although this will not be announced, especially in Germany.⁶⁴

The report states that Commandant Louw was sent by Basson to visit Germany and Israel. The purpose of the visit to West Germany was to have exposure to selected German industry related to CBW and to visit the German military's chemical and biological school.

One of the places visited was the firm Odenwald-Werke Rittersbach. Here Commandant Louw visited alone and remarked that he was received unusually warmly. The company showed an excellent understanding of South Africa and specifically the SADF. He also noted that this company did not want to do any business with Israel. In contrast, it is said that the visit to the CBW school was unsatisfactory and no information could be gathered. He reported that the trip to Israel was equally successful, and he proposed that consideration be given to a CBW training package that the Israelis would put together.

Basson testified in his bail application hearing that he was dismissed from the SADF at the end of 1992, and after that consulted on the management of a planned railway line in Tripoli for three years. He said he was also involved in consultation on the construction of hospitals. Basson claimed to have played a part in a deal that would see the Libyan oil industry becoming involved with or even coming to control Moss gas, a South African parastatal company involved in extracting natural gas from offshore fields and converting it into fuel products. He states that he took on this work after having left the SADF and that he withdrew from Libya after being told to do so by the United Kingdom and United States.⁶⁵

These statements by Basson are difficult to reconcile with the fact that there was not a three-year period during which he was not employed by the South African Defence Force. Basson was dismissed on March 31, 1993, then immediately re-employed for 12 months to "tie up the loose ends" of the project. That contract ended on March 31, 1994, and he was re-employed by the military after a cabinet decision on October 1, 1995. Basson must, therefore, have been engaged in Libya at the same time as being employed by the South African Defence Force. Basson testified at the bail hearing that he had

received partial payment for work done in Libya in 1996. According to Milton Leitenberg, however, the United States and the United Kingdom made a *démarche* to South Africa in 1995 that emphasized their concern that Basson had been transferring CBW knowledge to Libya.⁶⁶

Although the Department of Foreign Affairs had a representative at the TRC hearings in 1998 to ensure that testimony given would not jeopardize sensitive foreign relations, this did not prevent the witnesses from mentioning how and where they traveled, how they were received, and the extent to which assistance to the South African program had been available. What it did prevent the TRC from hearing were details of *démarches* to South Africa from the United Kingdom and the United States in 1993 and again in 1995. In these demarches, the two countries reportedly stated their concern about the South African CBW program, and urged the South African government to close it down. Gen. Knobel claimed at the TRC hearing that in 1993 US and UK representatives urged President de Klerk to close down the program, saying they were concerned that it should not end up in the hands of the African National Congress.⁶⁷

THE TRIAL OF DR. WOUTER BASSON

The criminal trial of Dr. Wouter Basson began in the Pretoria High Court on October 4, 1998. The state charged Basson on 64 counts, the charges ranging from fraud to murder. All are alleged to have taken place during the time in which Dr. Basson was the project officer for Project Coast. The charges included 12 for murder, seven for conspiracy to murder, three for attempted murder, and four for assault with intent to do grievous bodily harm. The murder charges include allegations of human experiments and of perceived enemies of the state being killed by the administration of muscle relaxants in overdose.

The trial began in October 1999 with an examination of the charges relating to the possession of the drugs ecstasy and mandrax. Basson's counsel argued that six of the 64 charges against Basson should be dropped. These included charge 31, which related to the poisoning of 200 SWAPO prisoners of war and the murder of five SWAPO members at Fort Rev, Ondangwa, Namibia, and charge 61, which charges that a CCB operative contaminated the water supply of a SWAPO transit camp in Namibia with cholera shortly before the elections in that country. The judge ruled that these charges would

have to be dropped since Basson qualifies for a general amnesty promulgated by the South African administrator general in Namibia in 1989. This law granted a blanket amnesty to all South African security forces who were operationally involved in Namibia prior to the elections.

The judge also ruled that charges 46, 54, 55, and 58 would have to be dropped on the grounds that the incidents took place outside South African jurisdiction. These included charges of conspiracy to murder Peter Kalangula in Namibia; conspiracy to murder ANC leaders Pallo Jordan and Ronnie Kasrils in London between 1987 and 1988; conspiracy to murder ANC member Gibson Mondlane in Mozambique; and conspiracy to murder Enoch Dlamini in Swaziland. The judge ruled that these charges could not be heard in a South African court.

The fraud charges against Dr. Basson relate to the establishment of an international network of companies that the state claims Basson established in order to defraud the project. Testimony given in court during the first half of 2000 linked Basson to many companies and contacts abroad. Basson's defense counsel has indicated that they will dispute the prosecution's claim that Basson intended to enrich himself.

CONCLUSIONS

Much of what is known of the South African CBW program in the apartheid era has been learned from the public hearing into the program held in 1998 by the South African Truth and Reconciliation Commission, from the documents revealed by the witnesses at that hearing, and from evidence presented in the criminal trial of Dr. Basson. An account has emerged of a program, Project Coast, that ostensibly fell under the control and supervision of the military but in reality was largely designed and executed by a single individual, Dr. Wouter Basson. The CBW program, although it was claimed by its protagonists to be strictly defensive in nature, went far beyond the strict constraints of a defensive program. Irritant gases for crowd control, addictive drugs, and chemical and biological substances for the purpose of killing individuals were part of the plan. Scientists recruited from universities and other institutions conducted their work on a strict "need to know" basis, an arrangement that appeared to make possible flagrant violations of ordinary professional ethical behavior.

The TRC did not rule on whether or not the CBW program had been responsible for the deaths of individuals or whether any individual persons were responsible for human rights violations. In part, such a ruling is likely to emerge from the criminal trial of Dr. Basson, which had not been concluded at the time of writing this article in September 2000. The TRC's final report did make clear, however, the commission's judgment that the program entailed significant abuses:

Ostensibly designed and conducted to support a 'defensive capability' in response to perceived external threats and international developments, the CBW program displayed numerous bizarre aberrations of policy, management and intent.... [I]t became clear at the hearing that the overall command by the Surgeon General and his colleagues on the coordinating committee was either ignored, or alternatively that they themselves were complicit in the program's criminal aberrations.⁶⁸

It is clear from the TRC evidence and related documents that South Africa's CBW program is unlikely to have succeeded without the international support it received and without the complicity of the many scientists involved. It would appear that the South African government at the time showed disregard for the international conventions that normally constrain national CBW programs and to which South Africa was a signatory. In order to clarify further the abuses committed as a result of the CBW program and the culpability for those abuses, any information about the program's activities that has not been released should be made publicly available.

¹ Jeremy Grest, "The South African Defence Force in Angola," in Laurie Nathan and Jacklyn Cock, eds., *War and Society: The Militarization of South Africa* (Cape Town: David Philips, 1989), p. 116.

² Marlene Burger, daily trial report of *The State vs. Wouter Basson*, prepared for the Centre For Conflict Resolution (CCR) research project on the South African Chemical and Biological Warfare Programme, November 22, 1999, unpublished (hereinafter cited as "daily trial report"). Note: Weekly reports, containing briefer summaries of some of the daily trial reports, are available on the CCR website, <http://ccrweb.ccr.uct.ac.za/cbw/cbw_index.html>. Where information from the daily trial report is also available in a weekly report, the web page location is noted.

³ Constand Viljoen, former chief of the South African Defence Force, interview by author, May 18, 2000.

⁴ Mark Swilling and Mark Philips, "State Power in the 1980s: From 'Total Strategy' to 'Counter-Revolutionary Warfare,'" in Nathan and Cock, *War and Society: The Militarization of South Africa*, p. 135.

⁵ *Ibid.*, p. 136.

⁶ Ben P. Steyn (Basson's successor as project officer), "Voorligting aan die Minister van Verdediging oor die verloop en huidige status van Projekte Coast en Jota te George op 7 Jan 1993" (Presentation to the Minister of Defence about the course and current status of Projects Coast and Jota in George on 7 January 1993), SADF document GG/UG/302/6/J1282/5, p. 1.

⁷ *Ibid.*

⁸ *Ibid.*, p. 2.

⁹ Ben P. Steyn, "Voorligting aan die Minister van Verdediging oor die verloop en huidige status van Projekte Coast en Jota te Pretoria op 10/8/93" (Presentation to the Minister of Defence about the course and current status of Projects Coast and Jota in Pretoria on 10/8/93), p. 2.

¹⁰ "Weaponization" is a term usually used in relation to nuclear weapons but which has been used by the military in relation to the South African chemical and biological warfare program. It refers both to the agent and the delivery system. Weaponization can be understood to refer to military weapons that can be delivered accurately, safely, and efficiently. H. Heitman, South African correspondent for *Jane's Defence Weekly*, telephone conversation with author, July 2000.

¹¹ Wouter B. Basson, "Projek Coast: Voorligting aan Staatspresident; 26 Maart 1990" (Project Coast: Briefing of the State President, March 26, 1990).

¹² Wouter Basson, "Projek Coast: Moontlikhede vir privatisering" (Project Coast: Possibilities for privatization), SADF document GG/UG/302/6/COAST/BFW, November 28, 1989, pp. 2-4.

¹³ Daniel P. Knobel, in the transcript of the TRC Hearing on Chemical and Biological Warfare, Cape Town, June 12, 1998, available on-line at <<http://www.struth.org.za/index.pl?&file=hearings/event/cbw/DAY05.HTM>>.

¹⁴ Marlene Burger, daily trial report, June 7, 2000, also available in the weekly summary, <http://ccrweb.ccr.uct.ac.za/cbw/basson_week20.html>.

¹⁵ Daniel P. Knobel, in the transcript of the TRC Hearing on Chemical and Biological Warfare, Cape Town, June 12, 1998, <<http://www.struth.org.za/index.pl?&file=hearings/event/cbw/DAY05.HTM>>.

¹⁶ André Immelman, "Verkope," 1989, available on-line at <<http://home.global.co.za/~jrad/verkope.htm>>. This document was found in one of the four trunks of documents recovered from the home of an associate of Basson at the time of Basson's arrest in 1997. Immelman acknowledged writing the list in an affidavit to the TRC in 1998.

¹⁷ Immelman, "Verkope."

¹⁸ Wouter Basson, "Magtiging vir die afverkoop van bates: Projek Coast" (Authorization for the sale of assets: Project Coast), SADF document HSF/UG/302/6/C123, August 19, 1991 (emphasis added).

¹⁹ Marlene Burger, daily trial report, May 22, 2000, unpublished.

²⁰ Ben P. Steyn, "Voorligting aan die Minister van Verdediging oor die verloop en huidige status van Projekte Coast en Jota te Pretoria op 10/8/93" (Briefing of the Minister of Defence about the chronology and current status of Projects Coast and Jota in Pretoria on 10/8/93), SADF document GG/UG/302/6/J282/5, August 10, 1993.

²¹ *Ibid.*, p. 4.

²² The privatization process is the subject of charges 23 and 24 of fraud against Basson, currently being heard in *Die Staat teen Wouter Basson in the Streekhof vir die Streekafdeling van Noord-Transvaal gehou in Pretoria* (The State vs. Wouter Basson in the Regional Court for the Regional Division of Northern-Transvaal held in Pretoria), case number 14/5594/97, November 7, 1997 (hereinafter, *The State vs. Wouter Basson*, Pretoria High Court).

²³ Ben P. Steyn, "Voorligting aan die Minister van Verdediging oor die verloop en huidige status van Projekte Coast en Jota te Pretoria op 10/8/93" (Briefing of the Minister of Defence about the chronology and current status of Projects Coast and Jota in Pretoria on 10/8/93), SADF document GG/UG/302/6/J282/5, August 10, 1993, pp. 4-5.

²⁴ Marlene Burger, daily trial report, November 23, 1999, also available in the weekly summary, <http://ccrweb.ccr.uct.ac.za/cbw/basson_week07.html>.

²⁵ Marlene Burger, daily trial report, August 7, 2000, also available in the

weekly summary, <http://ccrweb.ccr.uct.ac.za/cbw/basson_week22.html>.

²⁶ Daniel P. Knobel, in the transcript of the TRC Hearing on Chemical and Biological Warfare, Cape Town, June 12, 1998, <<http://www.struth.org.za/index.pl?&file=hearings/event/cbw/DAY05.HTM>>.

²⁷ Ibid.

²⁸ Ibid.

²⁹ Marlene Burger, daily trial report, November 30, 1999, unpublished.

³⁰ *The State vs. Wouter Basson*, Pretoria High Court, November 7, 1997.

³¹ Verkelinde Verdedigingsbevelraad: Notule van Vergadering gehou om 07h30 op 25 Oktober 1990 te Samik (Reduced Defence Council: Minutes of Meeting held at 07h30 on 25 October 1990 at Samik), SADF documents HS Plan/DP/302/6/COAST and HS PLAN/Dp/302/6/KEYBOARD, October 31, 1990.

³² Wouter Basson, "Projek Coast: Voorligting aan Staatspresident" (Project Coast: Briefing of the State President), SADF document GG/UG/302/6/C123/BK, March 26, 1990.

³³ Wouter Basson, in the transcript of the TRC Hearing on Chemical and Biological Warfare, Cape Town, July 31, 1998, <<http://www.struth.org.za/index.pl?&file=hearings/event/cbw/DAY11.HTM>>.

³⁴ Adriaan Goosen, in the transcript of the TRC Hearing on Chemical and Biological Warfare, Cape Town, June 11, 1998, <<http://www.struth.org.za/index.pl?&file=hearings/event/cbw/DAY04.HTM>>.

³⁵ The interaction is the subject of charge 38 against Basson: conspiracy to murder ANC supporter Roland Hunter. It is alleged that Basson made the snake and venom available to operators of the military who intended to inject him with the venom and leave the snake beside him so that when his body was discovered it would have appeared that he had been bitten by the snake.

³⁶ Geoff Candy, personal communication with Chandre Gould, Johannesburg, May 24, 2000; and Schalk Van Rensburg, personal communication with Chandre Gould, Pretoria, June 24, 2000.

³⁷ Charge 38 in *The State vs. Wouter Basson*, Pretoria High Court.

³⁸ For example, Dr. Schalk Van Rensburg told the TRC that scientists at Roodelpaat Research Laboratories had been worried about whether they could find other sources of funding for their research work. Transcript of the TRC Hearing on Chemical and Biological Warfare, Cape Town, June 9, 1998, <<http://www.struth.org.za/index.pl?&file=hearings/event/cbw/DAY02.HTM>>.

³⁹ Affidavit of Dr. André. Immelman, researcher at RRL, to the TRC Hearing on Chemical and Biological Warfare.

⁴⁰ All the scientists interviewed by the authors mentioned the secrecy maintained at the front companies.

⁴¹ Schalk Van Rensburg, in the transcript of the TRC Hearing on Chemical and Biological Warfare, Cape Town, June 9, 1998, <<http://www.struth.org.za/index.pl?&file=hearings/event/cbw/DAY02.HTM>>.

⁴² Adriaan Goosen, in the transcript of the TRC Hearing into Chemical and Biological Warfare, Cape Town, June 11, 1998, <<http://www.struth.org.za/index.pl?&file=hearings/event/cbw/DAY04.HTM>>.

⁴³ Schalk Van Rensburg, in the transcript of the TRC Hearing on Chemical and Biological Warfare, Cape Town, June 9, 1998, <<http://www.struth.org.za/index.pl?&file=hearings/event/cbw/DAY02.HTM>>.

⁴⁴ Ibid.

⁴⁵ Marlene Burger, daily trial report, May 29, 2000, unpublished.

⁴⁶ *Bacillus anthracis* is a highly infectious and virulent micro-organism which is the cause of the disease anthrax, also known as woolsorter's disease. Human infection is usually through the skin but may follow after inhalation or ingestion. Inhaling *B. anthracis* spores may result in pulmonary anthrax, which is often fatal. Botulinum toxin is the most poisonous biological toxin known. It is a nerve poison and is lethal in tiny doses. Paraoxon is an organophosphate pesticide. It is a potent nerve poison. Probable oral lethal dose for humans may be as low as 1-2mg/kg (1/50th of a teaspoon for a 70-kg person). Source: Correspondence from Dr. Gerbus Muller to Dr. J.P. Pretorius, Onafhanklike Deskundige Opinie (Independent Expert Opinion), March 10, 1999, entered as evidence in *The State vs. Wouter Basson*, Pretoria High Court, 2000.

⁴⁷ Schalk Van Rensburg, in the transcript of the TRC Hearing on Chemical and Biological Warfare, Cape Town, June 9, 1998, <<http://www.struth.org.za/>

[index.pl?&file=hearings/event/cbw/DAY02.HTM](http://www.struth.org.za/index.pl?&file=hearings/event/cbw/DAY02.HTM)>.

⁴⁸ Akte van Beskuldiging (Indictment/Charges), Vol. II, in *The State vs. Wouter Basson*, Pretoria High Court, 1999.

⁴⁹ Philip Loots, "Verdere Implimentering van Barnacle" (Further Implementation of Barnacle), Voortrekkerhoogte (Pretoria: January 9, 1981).

⁵⁰ Testimony of Johan Theron in *The State vs. Wouter Basson*, Pretoria High Court, May 3, 2000.

⁵¹ Akte van Beskuldiging, Vol. II, in *The State vs. Wouter Basson*, Pretoria High Court, 1999, p. 8.

⁵² Contrary to the perception created by Gen. Knobel, incapacitating agents are "classical chemical agents."

⁵³ "Kronologiese verloop van gebeure tov Kroatiese Transaksies" (Chronology of incidents with regard to Croatian Transactions), SADF document GG/UG/302/6/J1282, undated, p. 1.

⁵⁴ Ben P. Steyn, "Voorligting aan die Minister van Verdediging oor die verloop en huidige status van Projekte Coast en Jota te Pretoria op 10/8/93" (Briefing of the Minister of Defence about the chronology and current status of Projects Coast and Jota in Pretoria on 10/8/93), SADF document GG/UG/302/6/J282/5, August 10, 1993, p. 7.

⁵⁵ "Chronology of incidents with regard to Croatian Transactions," p. 2.

⁵⁶ Daniel P. Knobel, "Bewestiging Notas: Voorligting aan die Minister van Verdediging oor die verloop en huidige status van Projekte Coast en Jota op 7 Jan 1993" (Confirmation Notes: Briefing of the Minister of Defence about the chronology and current status of Projects Coast and Jota on 7 January 1993), SADF document GG/UG/302/6/J1282/5, January 8, 1993, p. 3.

⁵⁷ Ben P. Steyn, "Voorligting aan die Minister van Verdediging oor die verloop en huidige status van Projekte Coast en Jota te Gerge op 7 Jan 1993" (Briefing of the Minister of Defence about the chronology and current status of Projects Coast and Jota in George on 7 Jan 1993), SADF document GG/UG/302/6/J1282/5, January 7, 1993, p. 7.

⁵⁸ Ibid.

⁵⁹ "Chronology of incidents with regard to Croatian Transactions."

⁶⁰ J.G. De Bruyn, "Sertifiseering tov die vernietiging van Chemiese produkte op 27 Januarie 1993" (Certification with regard to the destruction of Chemical products on 27 January 1993), SADF document AI/UG/302/6/C123-2, March 30, 1993.

⁶¹ Itinerary for the visit of LTC Basson, the Republic of South Africa, May 26, 1981, including "Briefing: the general situation of Chinese Army Chemical School" and Wouter Basson, "Verslag: week eindigende 09/05/81," handwritten notes.

⁶² Borgaansoek van Dr. Wouter Basson in die Streekhof vir die Streekafdeling van Noord-Transvaal gehou in Pretoria (Bail application of Dr. Wouter Basson in the Regional court for the Provincial division of Northern Transvaal held in Pretoria); 8, November 3, 1997, p. 366.

⁶³ "Na 'n besoek deur die projekoffisier aan Moskou in Februarie 1991, is die projekoffisier bekendgestel aan 'n reeks persons wat in die gebied van die chemiese oorlogvoering werksaam is of was, onder andere 'n groep in Kroasie." Source: "Chronology of incidents with regard to Croatian Transactions."

⁶⁴ R. Louw, "Verslag: Buitelandse Besoek Kmdt R. Louw" (Report: Overseas Visit Commandant R. Louw), SADF document H Leer/D PROJ/UG/302/6/A576, August 5, 1988, p. 1.

⁶⁵ Borgaansoek van Dr. Wouter Basson in die Streekhof vir die Streekafdeling van Noord-Transvaal gehou in Pretoria; 8, November 3, 1997, pp. 358-360.

⁶⁶ Milton Leitenberg, personal communication (telephone discussion), 2000.

⁶⁷ Daniel P. Knobel, in the transcript of the TRC Hearing on Chemical and Biological Warfare, Cape Town, June 18, 1998, <<http://www.struth.org.za/index.pl?&file=hearings/event/cbw/DAY06.HTM>>.

⁶⁸ TRC Final Report, Vol. 2, Chap. 6, "Special Investigation into Project Coast: South Africa's Chemical and Biological Warfare Program," October 29, 1998, available on-line at <<http://www.polity.org.za/govdocs/commissions/1998/trc/2chap6c.htm>>.