Central Intelligence Agency

Washington, D.C. 20505

14 November 2014

Mr. John Greenewald, Jr.
[redacted]

Reference: F-2015-00270

Dear Mr. Greenewald:

This is a final response to your 4 November 2014 Freedom of Information Act request, received in the office of the Information and Privacy Coordinator on 5 November 2014, for **a copy of records pertaining to Project Coast.**

Our records show that we conducted a search on behalf of an earlier request for records pertaining to the subject of your request. Therefore, we are enclosing two documents, consisting of 57 pages, which were located and released in connection with the earlier request. Because you are entitled to the first 100 pages, there is no charge for processing your request.

Sincerely,

John Giuffrida
Acting Information and Privacy Coordinator

Enclosures

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Director of Central Intelligence

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Chemical Weapons: Use in Angola?

Committee Intelligence Report

by the
Weapon and Space Systems
Intelligence Committee

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WSSIC 89-10006
November 1989

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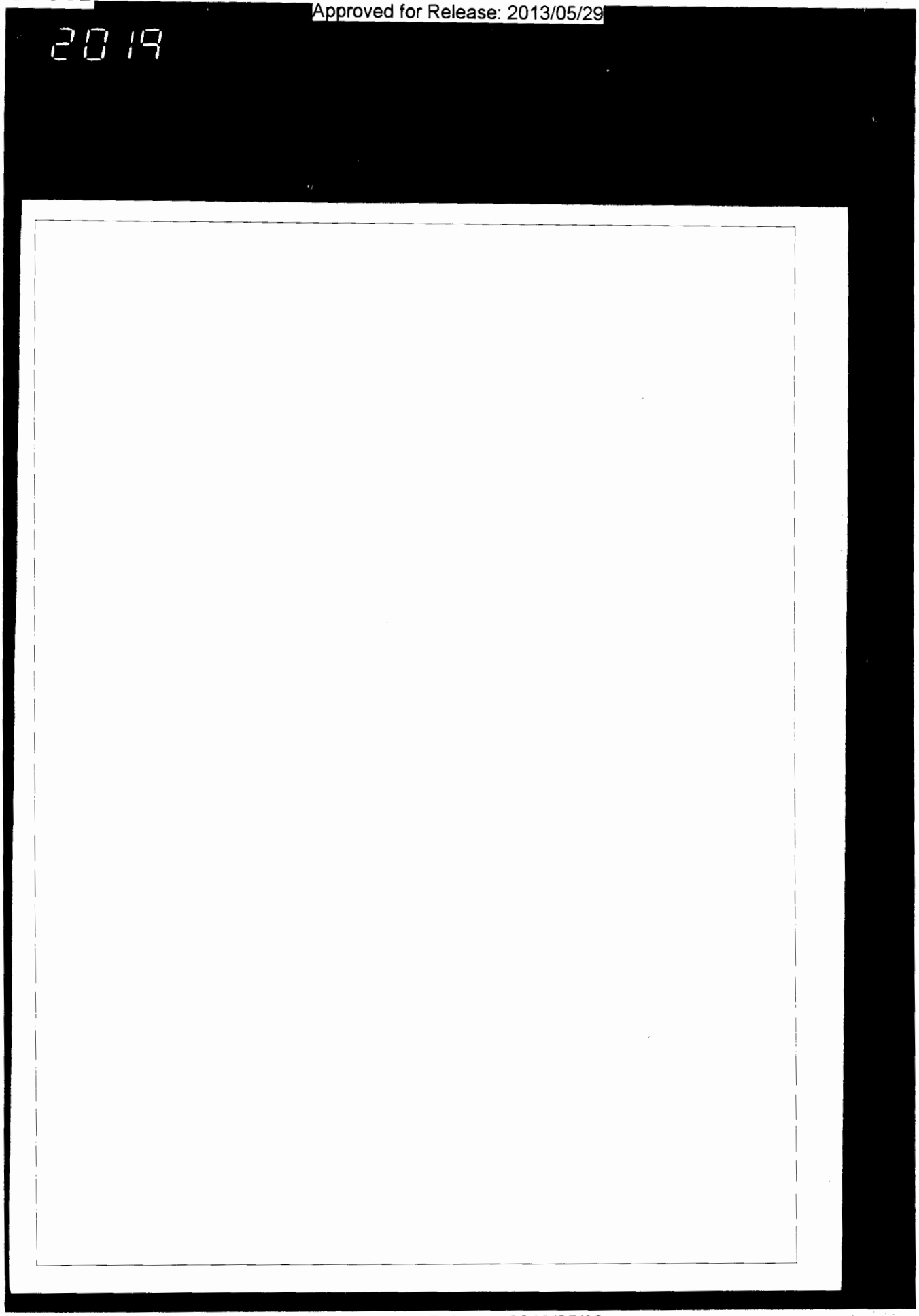

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Chemical Weapons: Use in Angola?

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Preface

This paper provides an Intelligence Community coordinated assessment regarding the reported use of chemical weapons in Angola. There is Intelligence Community agreement that technical public reports submitted to the US Government as proof of CW use in Angola contain no substantive evidence to indicate the use of lethal CW agents in Angola. The findings are provided in an unclassified summary

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SUMMARY

During the last few years, there have been repeated allegations that lethal chemical warfare (CW) agents have been used in Angola. The US Government has investigated these allegations and has found no substantive evidence to indicate the use of lethal agents in Angola. Further, technical analysis of the public reports submitted as proof of CW use in Angola has led us to conclude that they do not support the author's contention of CW use. There is insufficient evidence to confirm the use of lethal CW agents in Angola.

Though we cannot eliminate the possibility of limited undetected use of chemical agents, there is no evidence at hand (i.e., chemical agent, chemical agent residue or byproduct) to verify the presence of known nerve, blood, or blister type agents. The United States government has not been able to gain access to the samples which have been reported by others to contain chemical agents nor have US government laboratories been able to detect any chemical agent or any other samples from Angola. No other laboratory has confirmed any positive results although several have attempted to do so utilizing the most sophisticated techniques currently available. All of the phenomena observed in Angola to date can be attributed to events other than lethal chemical agent use. However, there are indications of the use of non-lethal agents such as riot control or vomiting agents.

Medical reports of signs and symptoms associated with alleged CW casualties are not characteristic of any known traditional nerve, blood, or blister agent. In some cases (such as the delayed neurotoxicity cases), they are indicative of chronic poisoning due to food/water contamination by a common fuel additive, tri-ortho-cresyl-phosphate (TOCP). In other cases, they are consistent with the use of riot control agents, such as 2-chlorobenzamalononitrile (CS) or vomiting agents, such as the arsine agent adamsite (DM). Dietary factors such as consumption of high levels of cyanogenic plants (for example: cassava) coupled with a deficiency of protein also account for some of the reported signs and symptoms. Additionally, weapons such as napalm, white phosphorous, and fuel air explosives can produce effects that could be mistaken for the effects of some chemical agents.

Appendix 1

Technical Analysis of the Reports Submitted to Department of Defense as Proof of CW Agent Use in Angola

A series of reports were submitted as proof of the claim that nerve, blood, and blister agents, and possibly new agents, have been used against UNITA personnel. This claim was based on analyses of biological and environmental samples and on clinical evaluations of the alleged victims. As detailed below, the information which has been presented to the US in seminar or report form does not support the allegation of lethal CW use and is subject to alternative interpretations. Specific analysis of the evidence submitted as proof of the use of each type of agent is provided below.

A. Nerve agents

1. Clinical Evaluations of Patients

Based on evaluations of the signs and symptoms of alleged victims of CW attacks in Angola, it was concluded in several reports that individuals had been exposed to nerve agents. The typical patient reports initial confusion, vomiting, and difficulty in breathing, followed by weakness in the lower extremities. This usually disappears in a matter of hours. After about a month, weakness develops in the lower extremities. This gradually moves up the legs, resulting in paralysis and eventual loss of bladder and bowel control. Over time, some of these problems spontaneously resolve but the paralysis remains. This pattern of signs and symptoms is not characteristic of any known nerve agent or any other CW agent.

The gradual development of long-term paralysis of the lower limbs is characteristic of exposure to certain industrial chemicals or to certain infectious diseases. Chemicals capable of producing such effects include tri-ortho-cresyl-phosphate (TOCP) as well as other related organic phosphates. Although nerve agents are organo-phosphates, they do not produce the kind of delayed neurotoxicity which has been described in these reports. TOCP is used as an additive in fuels and lubricants as well as in

the processing of certain foods such as ginger. TOCP intoxication due to contaminated cooking oil and/or water drums has occurred previously in southern Africa. Exactly how these personnel were exposed to TOCP is subject to conjecture. Exposure may be related to the use of contaminated containers to transport water to the battlefield. Discarded motor oil containers have been used to store water at one of the medical facilities treating these patients. Therefore, it is concluded that the submitted clinical evaluation reports do not provide proof of nerve agent use in Angola but rather indicate industrial chemical poisoning probably due to TOCP exposure.

2. Analyses of Biomedical Samples

The author of these reports claim to have a blood test capable of detecting nerve gas exposure in "some" of the patients 12 months or longer after an alleged attack. The nature of this test has not been explained but the analyses cited in the reports were simply blood cholinesterase determinations. None of the patients showed cholinesterase levels which were significantly different from the range of medically accepted normal levels. In any case, use of reduced cholinesterase levels as evidence of nerve agent use is ambiguous without corroborative evidence. Depressed cholinesterase levels can result from anemia, antimalarial therapy, liver disease, malnutrition, chronic inflammation, or use of drugs such as morphine or codeine, as well as exposure to common environmental contaminants such as pesticides. In addition, the cholinesterase depression resulting from nerve agent exposure is reversed within four to ten days after exposure in an individual without genetically depressed pseudocholinesterase levels.

3. Analyses of Environmental Samples

The results of analysis of two sets of environmental samples were contained in the reports. The first set of "stones and growth" was acquired on 30 April 1988 and arrived at the University of Ghent for analysis on 11 June 1988. The date of the alleged CW attack was not provided. The report stated that there was a "high probability" that mustard gas and neurotoxic gases had been used. The US Government has not been allowed access to these samples to conduct independent tests. Details of the analysis procedures used have not been provided but apparently colorimetric assays were used. Because of the

highly probable interference of substances found in the environment, colorimetric tests are subject to numerous false positives and do not provide conclusive proof of chemical warfare agent use. In the reports, the results of acetylcholinesterase activity tests are cited as proof of nerve agent presence. No controls were analyzed and the experimental values that the report author considered indicative of the nerve agent presence are in fact within normal range.

B. Cyanides

1. Clinical Evaluations

During a seminar given 11 July 1989 to a panel of US scientists, it was suggested that the signs and symptoms of alleged victims in Angola have resulted from exposure to a new type of cyanide "never seen in the West," specifically calcium cyanide.

Animal toxicity tests were conducted by the Soviet Union in the 1940s and 1950s, but there is no evidence to suggest that calcium cyanide was developed as a chemical agent. Little is known about the effects of calcium cyanide in humans but the pattern of signs and symptoms in the alleged victims do not appear to be the result of exposure to a cyanide based chemical agent. The effects reported are highly variable among patients and are likely to have resulted from a variety of causes. The delayed neurotoxicity observed in several individuals probably results from intoxication from non-nerve agent organophosphates, such as TOCP. The temporary eye effects are consistent with exposure to a variety of agents, including riot control. The severe burns on the skin seen in a few cases are consistent with exposure to napalm or white phosphorus or possibly fuel air explosives. The atrophy of the optic nerve cited in a few cases may result from a condition, Nigerian nutritional neuropathy, which occurs frequently in southern Africa. This condition, also known as Tropical Ataxic Neuropathy (TAN), is caused by eating cassava, a major food source in this region. The cassava plant contains high amounts of a cyanogenic glycoside called linimarine. It also contains an enzyme which rapidly liberates considerable amounts of cyanide if the leaves, stem, or starch containing roots are damaged. Cyanide intoxication can occur from consumption of large amounts of cassava. The syndrome which develops is characterized by atropy of the optic nerve, sensory spinal ataxia, and deafness. This syndrome is very similar to the

effects described in some of the patients and is consistent with the lower limb paralysis and spasticity observed. A combination of chronic exposure to TOCP and cassava consumption could result in severe neurotoxicity. The Angolans make extensive use of cassava flour, both as a starch source and as an extender for wheat flour in bread. Particularly during the dry season, their diet is mainly dependent on starch for calories and is generally protein deficient. It has been shown in scientific literature that development of neurological damage from chronic cyanide intoxication is enhanced by dietary protein deficiency due to a decreased ability to metabolize the cyanide.

2. Analysis of Biomedical Samples

The reports state that cyanide was found in the blood and urine of an alleged victim. These samples have not been made available to the US for confirmatory analyses. Details of the testing procedure are lacking but it is assumed that standard microdiffusion followed by colorimetric detection was used. Cyanide is normally present in biological fluids due to ingestion of cyanogenetic foods and exposure to cigarette smoke. In areas where the cassava plant is a major food source, these levels can be quite high. In addition, one of the most frequently used riot control agents, CS, is metabolized to cyanide in the peripheral tissues. A further complicating factor is that the level of detectable cyanide increases as the sample ages and cyanide containing compounds breakdown. Accurate determination of cyanide levels requires analysis of fresh samples. The time between collection and sample analysis was several months in this case and the samples had putrefied. In addition, no matched control samples were analyzed for comparison to normal levels. Given the lag time between sample collection and analysis, the results contained in the report cannot be interpreted as definite proof of exposure to any cyanide CW agent.

3. Analysis of Environmental Samples

No evidence of cyanide presence was found in the first set of environmental samples analyzed. The second set of samples were collected by a journalist, Mr. Andreas Holst, on 4 April 1989 after a bomb explosion on 29 March 1989. The set of four samples was delivered to the University of Ghent in Belgium. The date of analysis is not given but occurred before

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May 1989 when a report was issued. The sample included a bomb fragment, dust from the bomb crater, sand taken from around the crater, and a portion of the bomb found inside the crater. The report stated that the bomb was of Russian origin with an aluminum casing.

According to the report, testing for CW agents showed very high amounts of cyanide. These samples have not been available to the US Government for confirmatory testing and details of the testing procedures used have not been provided. Further, the reports indicate that the tests for cyanide were not quantitative so it is not clear what is meant by "very high amounts." The testing procedures probably used in this analysis are subject to high rates of false positives due to interfering substances. Based upon the incomplete data provided in the report, it is not possible to conclude that cyanide compounds were present on these samples.

C. Mustard Agents

1. Clinical Evaluations

None of the individuals described in the reports showed signs and symptoms consistent with mustard poisoning.

2. Biomedical Samples

The reports cited evidence of mustard exposure in the urine of the same individual which had been reported to show elevated blood cyanide levels. This sample has not been made available for confirmatory analysis. No details of the testing procedures or the nature of this evidence were provided. Control samples were not analyzed and the precision of the laboratory analysis is unknown. It has been shown that the urine of normal healthy individuals contains substances that interfere with the currently available assays for mustard metabolties. Thus, the information provided is insufficient to prove mustard use.

3. Environmental Samples

The "stones and growth" samples reportedly gave strong positives for mustard. These samples have not been made available for independent confirmatory testing. No details of testing procedures have been provided, control samples were not analyzed, and the precision of the laboratory analysis is unknown.

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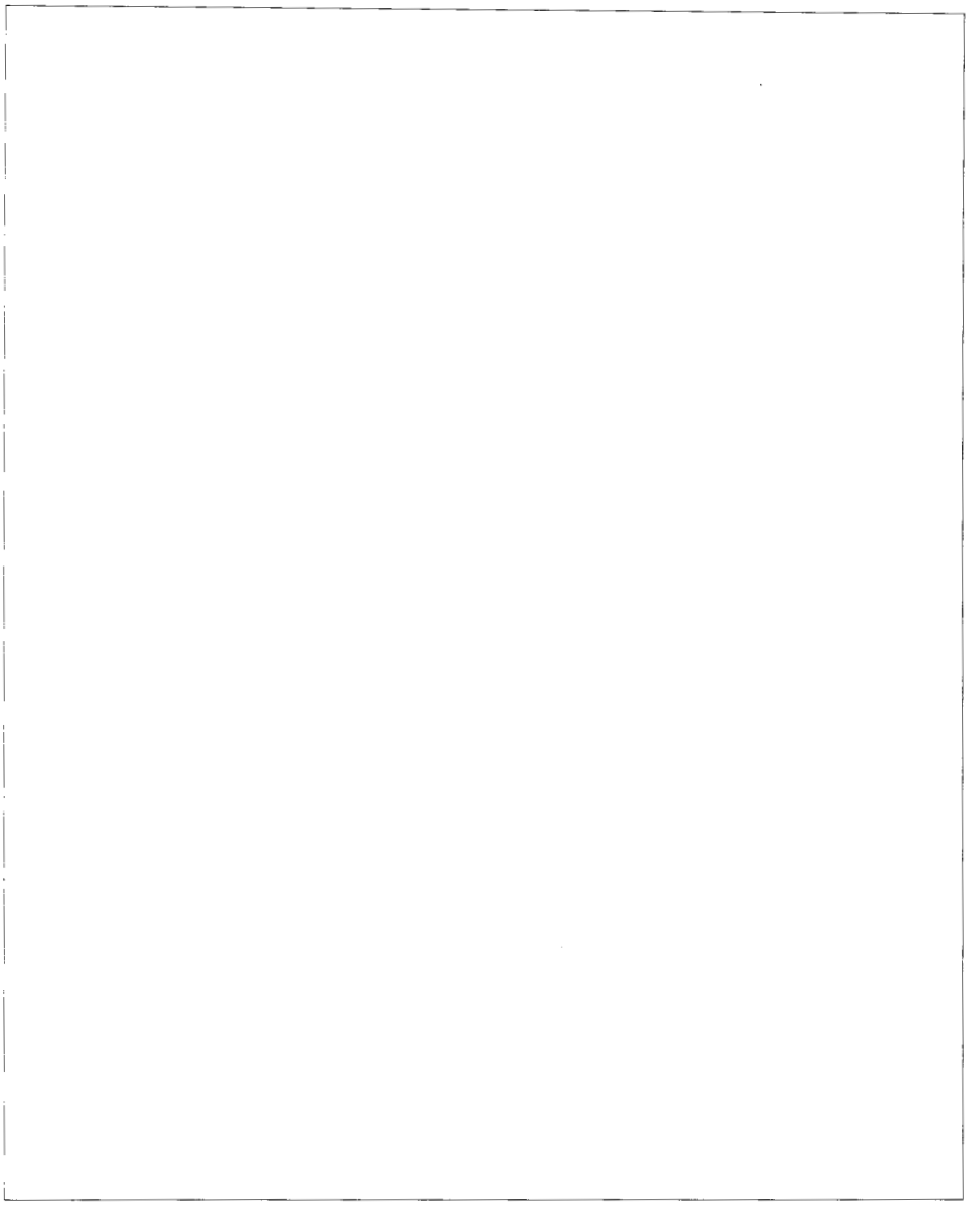
Appendix 2



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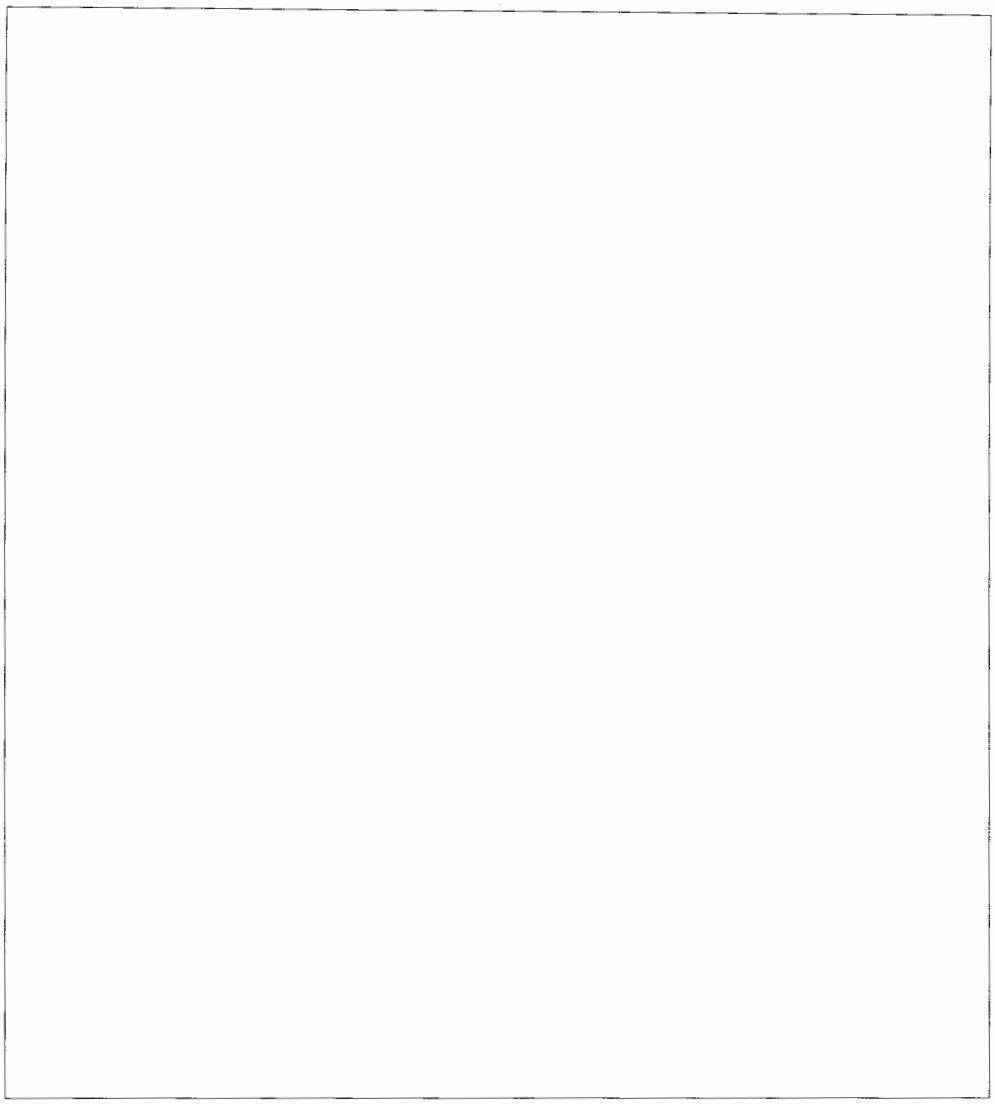

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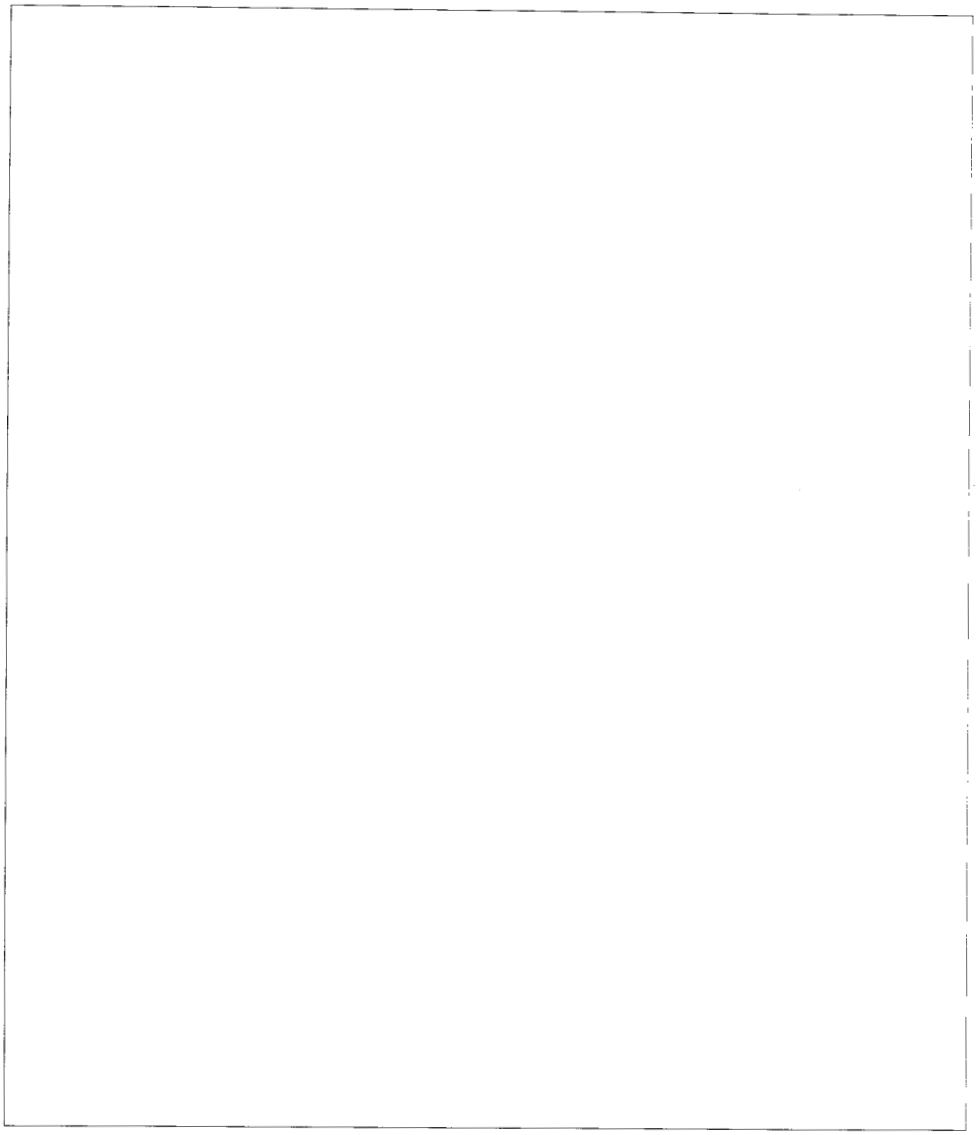

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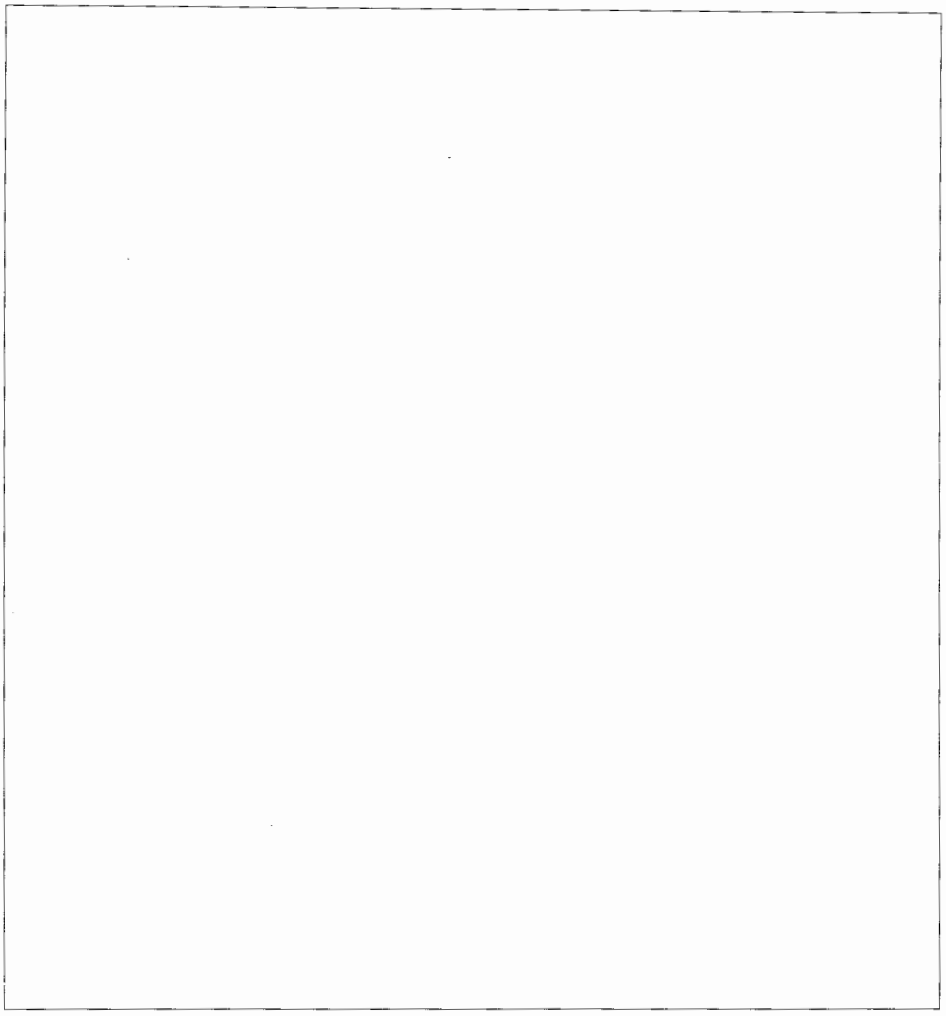

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