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Likelihood of a Proliferation of BW
and CW Capabilities

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TABLE OF CONTENTS

	<i>Page</i>
THE PROBLEM	1
SCOPE NOTE	1
SUMMARY AND CONCLUSIONS	1
DISCUSSION	4
I. GENERAL CONSIDERATIONS	4
A. Definition of Terms	4
B. Concepts and Doctrine	4
Chemical Warfare	4
Biological Warfare	5
C. Technical Requirements	6
Chemical Warfare	6
Biological Warfare	7
D. Foreign Sources of Information, Raw Material, and Equipment	7
II. CAPABILITIES	8
III. INTENTIONS	9

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LIKELIHOOD OF A PROLIFERATION OF BW AND CW CAPABILITIES

THE PROBLEM

To assess the capabilities and intentions of additional countries to achieve biological and lethal chemical warfare capabilities during the next three years or so.

SCOPE NOTE

This estimate excludes the USSR and its Warsaw Pact allies





Our consideration of BW agents includes all those suitable for use against personnel, livestock, crops, and materiel; consideration of CW agents excludes incapacitating and riot control agents, and smoke, flame, and defoliant chemicals.

This estimate does not concern itself with BW or CW as instruments for clandestine use in assassination, small-scale terrorism, and the like.

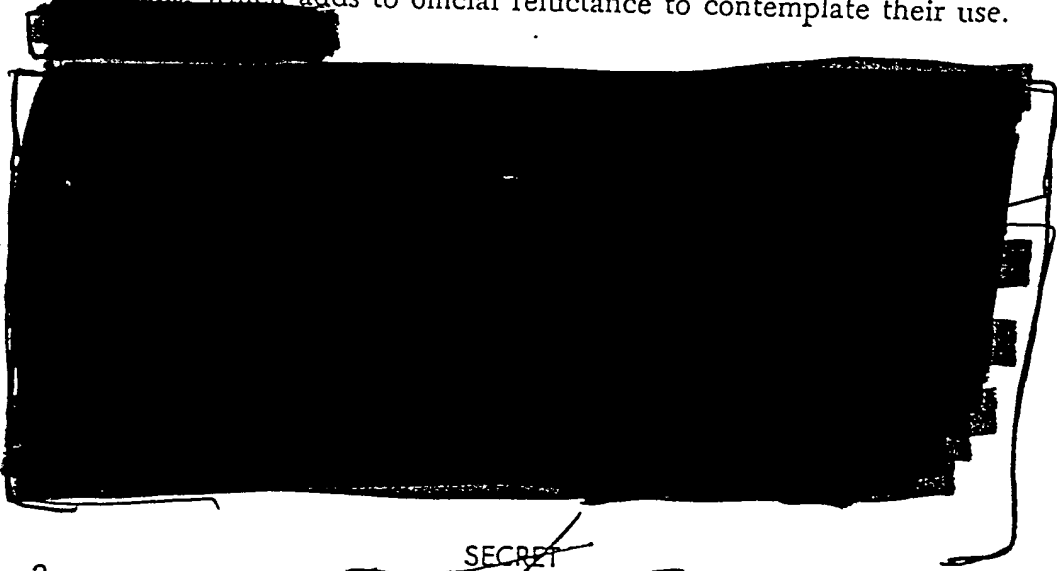
SUMMARY AND CONCLUSIONS

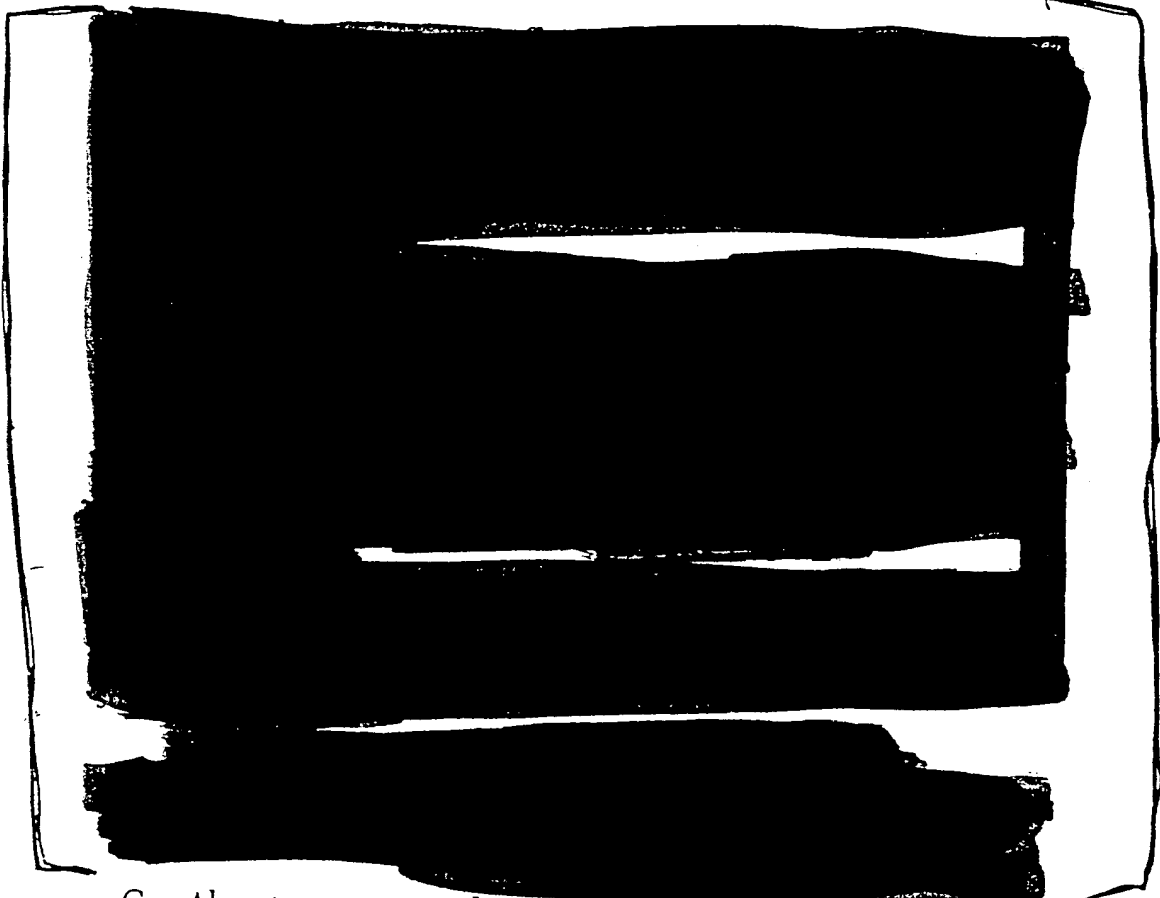
A. For any reasonably modernized state, and even for many of the less developed nations, there are few obstacles in the way of acquiring at least some BW and CW capability. The technology underlying BW and CW is widely known or easily obtainable through open

sources; the physical facilities required to develop and produce agents are in great part quite easily adaptable from existing chemical and pharmaceutical facilities; the means of delivery comprise a wide range of conventional weapons and even non-military equipment; and, overall, the costs are relatively small, at least for an offensive capability appropriate to most states' conceivable needs. 

B. Yet despite these considerations, there is not now a trend toward the proliferation of BW or CW capabilities in the world. Such proliferation could occur during the next few years, notably through a snowballing process of mounting fear and suspicion, and of action and reaction on the part of particular sets of adversaries among the middle and smaller powers, but proliferation cannot now be judged likely. 

C. A number of factors work to restrain BW and CW proliferation. The very fact that many states could achieve a capability with relative ease gives these weapons the quality of a two-edge sword. Prudence would dictate that countries deciding to acquire an offensive or retaliatory capability should also undertake to develop a defensive capability, and the requirements of doing so would add to the price, almost prohibitively if adequate provision were made for civilian needs. Most military doctrine on CW, and even more so on BW, lays emphasis on the defensive aspects of the problem, which is some evidence of a reluctance to be the first user. And finally, there exists an almost universal popular moral and psychological abhorrence of these forms of munitions, which adds to official reluctance to contemplate their use.





G. Almost any semi-industrialized country could easily acquire *token* native capabilities in either field (i.e., enough for one or two attacks on important targets). Any country could quietly acquire through commercial channels at least a token capability in the less toxic World War I-type CW agents. [REDACTED]

H. Present evidence does not warrant an estimate that any nation is now determined to achieve a meaningful operational capability in either BW or CW during the next few years. We believe that most states will remain reluctant to do so. Nonetheless, some may proceed toward this goal, as a deterrent or retaliatory measure in case a potential adversary develops a capability, as a supplement to nuclear weapons, or possibly as the best available substitute for them. [REDACTED]

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DISCUSSION

I. GENERAL CONSIDERATIONS

A. Definition of Terms

1. In the following discussion, BW and CW capabilities are considered in three broad categories:

(a) Significant military capability—one which would enable a country to mount and sustain extensive BW or CW operations over a period of time;

(b) Limited military capability—one which would be useful in waging war, though not great enough for sustained operations; and,

(c) Token capability—one sufficient to permit only one or two effective overt or covert attacks on major enemy targets. In applying these terms, we have been mindful that what might be only a token or limited BW or CW capability for one country may be a significant one for another when judged in the context of its military requirements against likely adversaries. In applying the terms "significant" and "limited," we have also taken account of prevailing BW and CW doctrine which usually requires that offensive capabilities be matched by an adequate defense against likely retaliation by the adversary. A "token" capability would not, of course, necessarily include means of defense.

B. Concepts and Doctrine

Chemical Warfare

2. Military doctrine of the major powers classifies lethal chemical weapons as primarily tactical weapons, suitable for theater combat as supplements to other weapons, both nuclear and non-nuclear. Toxic chemical munitions have certain advantages over other munitions. They can achieve a wider area of lethal coverage than high explosives with a fraction of the logistic volume, and their effects are more persistent and in some respects more demoralizing. Unlike either high explosives or nuclear weapons, they can destroy personnel without destroying installations. They may also be more effective than other weapons in penetrating structures to reach personnel protected from other types of attack. Furthermore, even the threat of their use may lower the combat effectiveness of enemy troops by forcing them to carry and use encumbering protective gear.

3. CW also has its limitations. Although detection systems are still imperfect, protective equipment coupled with good troop discipline can be highly effective.

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in reducing or negating the effects of chemical munitions. Surprise, therefore, is usually an essential element in the tactics of CW employment, and the attacker's advantage is likely to be temporary unless, of course, the defender lacks adequate protective gear. In wars between approximately equal military forces, prudence would dictate that the initiator of CW guard against retaliation by adopting protective measures at least as effective, and therefore as cumbersome, as those of his adversary. Furthermore, unless decisive results were expected from his initial attack, the initiator would need sufficient CW munitions to continue such attacks on at least equal terms with his adversary. Meanwhile, the course of battle would probably turn on other factors.

4. Among the major powers, the use of chemical munitions in long-range strategic attack appears not to be contemplated. Nuclear weapons are rated as far more effective in a strategic role. Moreover, there is a tendency among these powers to group chemical (and biological) weapons with nuclear weapons as non-conventional armaments subject to the same political restraints and, consequently, there is no confidence that the employment of CW weapons would not lead eventually to a nuclear exchange. In conflicts not involving any of the nuclear powers or their military allies, there would, of course, be less concern over such escalation.

5. Even among countries with only a limited CW military capability or merely a token one, chemical munitions are more likely to be viewed as a deterrent to similar attacks by enemies of roughly equivalent military strength or as retaliatory precautions rather than as offensive weapons. Exceptions might occur. For example, a country at war might be tempted to employ chemical munitions where a major tactical breakthrough seemed possible, or as a measure of desperation to avert an unacceptable setback. Chemical munitions might also be employed in remote areas to intimidate primitive adversaries, as the Italians did in Ethiopia in 1935 and, more recently, as the Egyptians have done in the Yemen.*

Biological Warfare

6. The delayed effects of BW weapons narrow the range of their usefulness on the battlefield. A more important restraint, however, is the vulnerability of the initiator's own forces to retaliatory attack, especially because of the difficulty of detecting such attack in time to adopt protective measures. Moreover, the military effectiveness of such weapons is problematical; they have never been adequately tested. Small quantities of BW agents, however, might do a

* During 1963, the UAR on several occasions dropped aerial bombs containing a type of tear gas on royalist forces in the Yemen. At least once, this agent proved lethal in high concentrations.

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great deal of damage to an enemy in some tactical situations, and might be a valuable adjunct to other weapons.

7. With respect to strategic use of BW agents on a large scale the main problem lies not only in the danger of escalation into nuclear war but also in the difficulty of protecting a civilian population against possible retaliatory attack in kind. An adequate BW defensive capability for the civilian population would be extraordinarily costly and difficult to achieve and only the most advanced countries in the world could even hope to do so. Essential requirements include an elaborate civil defense establishment, adequate medical personnel, and high civilian health standards, including good personal hygiene and proper water and sanitation systems. Even so, detection, protection, and immunization programs on a scale required to adequately protect large populations are almost impossible to achieve. Agents designed for use against crops or livestock are even more difficult to defend against, though they may not present the same danger of escalation.

C. Technical Requirements

Chemical Warfare

8. A country's native CW capability—present or potential—is closely related to the level of sophistication of its chemical and conventional munitions industries, including their supporting staffs of scientists, engineers, and technicians. Civilian chemical industrial and laboratory facilities are readily adaptable to the production of highly toxic CW agents. Of particular interest in the production of modern nerve agents are plants producing organo-phosphorous chemicals (e.g., certain pesticides). The output of plants engaged in production of such widely used industrial chemicals as chlorine, phosgene, and hydrogen cyanide—all important World War I toxic CW agents—could be diverted directly to chemical munitions. Hardware adaptable to CW needs includes a variety of civilian products, such as spray equipment and thermogenerator devices, as well as the full range of conventional military items. The production of defensive equipment would require supplies of rubber, charcoal, and plastics, and fairly well-developed textile and electronics industries. Civil defense would also depend on a country's medical resources, the general literacy and discipline of its population, and any shelter programs that could be adapted to CW defense requirements.

9. To start from scratch to build a significant CW capability would, of course, be very costly, but most modern countries already possess the basic industrial and technical capabilities upon which to build and could achieve high levels of production with relatively small additional expenditures. In other countries, a limited native capability could probably be achieved for a few million dollars,

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especially if programs are focused on the less toxic, World War I-type chemical agents. Several thousand pounds of these agents could be produced daily in a few relatively modest laboratory-type production facilities or processing plants. These agents or their major ingredients could also be purchased on the open market. A token native capability could be achieved by a few competent chemical technicians. Within a few months, they could secretly produce up to several thousand pounds of relatively sophisticated chemical agents by laboratory methods at a cost of only about \$20 per pound. Raw materials could be procured in the required quantities without arousing suspicion.

Biological Warfare

10. The achievement of a BW capability presents somewhat greater problems than does CW: agents cannot be obtained commercially in quantity, delivery systems are generally more complex, and the deterioration of agents prevents storing for an indefinite period. Nevertheless, any country with good pharmaceutical industries has a potentially significant BW capability. To develop from the beginning a stock of agents sufficient for a significant BW capability would require a major effort involving the services of a thousand or more professionals and technicians. A limited capability, based on existing pharmaceutical and fermentation plants, would, however, require only a fraction of the trained personnel, and could employ, in addition to conventional military delivery systems, a variety of civilian spray and aerosol generating equipment. A token capability could be achieved covertly by a few competent technicians under laboratory conditions and need not cost more than a few thousand dollars. In all cases, however, the rapid deterioration of BW agents and related storage problems would hamper the maintenance of existing capabilities.

D. Foreign Sources of Information, Raw Material, and Equipment :

11. Any country with a reasonably competent technical collection facility, maintained over the past five or six years, could obtain extensive information on CW and BW research and defense efforts of the US from private and unclassified government sources. Open Soviet literature would provide useful information on CW production technology, and medical, vaccine, and aerobiology programs related to Soviet BW defense. The Netherlands, France, and Italy also publish useful information on BW and CW defense. The utility of such information depends heavily on a country's overall scientific and technical capabilities. At a minimum, analysis of available information would help narrow fields of research into militarily profitable channels. This is especially true in the biological sphere where innumerable diseases have been studied to determine those most suitable for BW application. In the CW area, most information on militarily useful agents is available in the open literature except, perhaps, some refinements

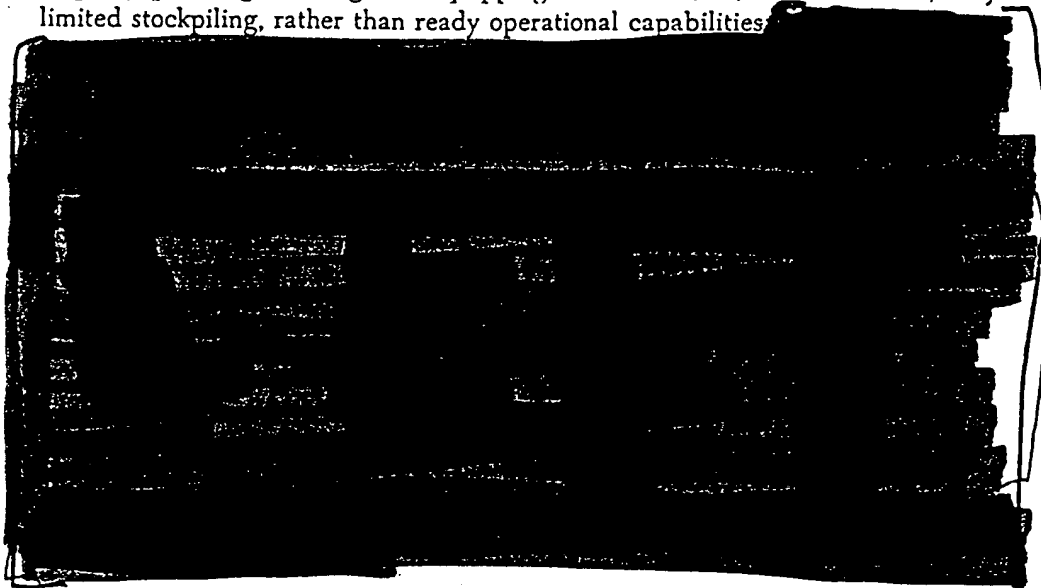
of manufacturing technique. Some aspects of the employment of BW and CW agents on the battlefield are covered in unclassified training and field manuals.

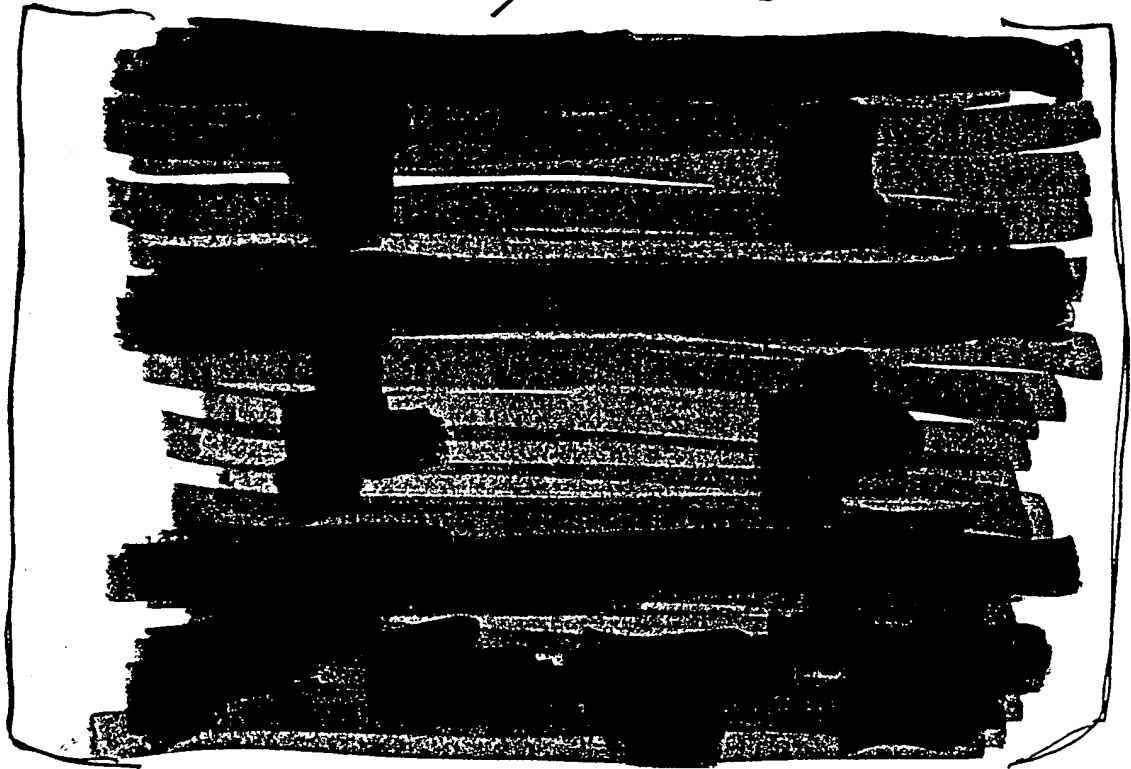
12. Even if a country lacked the required industrial and technological base, much of the raw material and equipment for the production and delivery of CW and BW agents is internationally obtainable. Among industrial chemicals used in CW agent production, phosgene, chlorine, chloropicrin, pinacolyl alcohol, hydrogen cyanide, and a thio derivative of methylchlorophosphine are commercially available. Chemical plant equipment can be obtained from advanced industrial countries.

The USSR and its European allies are also capable of delivering chemical plant equipment abroad, though priority domestic needs have kept and are likely to keep such sales to a minimum. Although BW agents cannot be procured commercially, a virulent seed culture for the production of BW agents can cheaply and easily be obtained from any number of scientific institutions. Certain vaccines useful for BW defense are obtainable in quantity commercially. Pharmaceutical plants and equipment have also been exported by the developed countries, but much less commonly than fermentation plants and refineries which might, also be useful in BW agent production.

II. CAPABILITIES

13. Excluding the US and the Warsaw Pact states, there are, to the best of our knowledge, now countries with BW programs and with CW programs. Most of these programs are matters of research and development contingency planning, training and equipping for defense, or, in a few cases, very limited stockpiling, rather than ready operational capabilities.






Almost any semi-industrialized nation could easily develop *token* native capabilities in either field; and any country could, of course, quietly acquire through commercial channels at least a token capability in the less toxic World War I-type CW agents.

III. INTENTIONS

17. Present evidence does not warrant an estimate that any nation under consideration is now determined to achieve a meaningful operational capability in either BW or CW during the next few years. We believe that most states will remain reluctant to do so. Nonetheless, some may proceed toward this goal, as a deterrent or retaliatory measure in case a potential adversary develops a capability, as a supplement to nuclear weapons, or possibly, as the best available substitute for them.



18. *Europe and the Commonwealth.* In Europe  the emphasis in research, development, and production has been on defense against BW and CW attacks. No major change is expected for several reasons. For one thing, popular abhorrence developed during World War I serves as an effective psychological restraint on the acquisition or expansion of BW or CW offensive weapons. All European

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countries (except Iceland) adhere to the Geneva Convention of 1925 which outlaws offensive use of BW or CW weapons. In West Germany, the manufacture of BW and CW weapons is prohibited by international agreement. Austria is treaty-bound not to make, possess, or experiment with BW or CW agents or weapons.

19. In general, so far as most Western European states show an interest in either field, it is most likely to be focused on defensive programs. [REDACTED] For the most part, they will prefer to count on the US capability to provide retaliation in case of enemy use in war. In most of the smaller NATO countries, higher priorities for other types of military equipment, combined with tight defense budgets have reinforced an existing disinclination to move themselves into BW and CW fields. [REDACTED]

[REDACTED] If NATO strategy should be revised to diminish reliance on nuclear deterrence, it is possible that a growth of interest in BW and CW weapons will take place.

21. *Far East.* Communist China relied almost entirely on the USSR for its CW needs until 1960, but has since continued research and development activities on its own. The Chinese are conducting research on organophosphorous insecticides (related to CW nerve agents) and have published pharmacological and toxicological data on nerve agents in military journals. They have some stocks of CW munitions, probably including toxic types. However, efforts to achieve a major expansion of their CW capability would be severely handicapped by inadequate scientific and technical personnel and chemical plant facilities. It is possible, though unlikely, that the Chinese would accord the necessary priorities to their CW effort if convinced that it would serve as some sort of deterrent against possible US or Chinese Nationalist attacks. It is even less likely that Peiping would divert scientific manpower and materiel to the development of untested biological weapons; their present BW program is probably primarily a research effort on BW agents and on methods and material to defend against them.

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22. [REDACTED]

23. [REDACTED]

24. *Others.* Token BW and CW capabilities might be acquired by any number of countries for use as a threat or as a deterrent against a likely enemy. Conflicts between India and Pakistan, Indonesia and Malaysia, Greece and Turkey, and Portugal and its African colonies might lead one side or the other to consider the use of chemical or, less likely, biological agents on a "one-shot" basis. [REDACTED] these adversaries, only Turkey now possesses any sort of military program in CW and this is purely defensive; none of these countries is even started in BW. Turkey and probably India could most easily develop their own chemical [REDACTED]

[REDACTED]

[REDACTED]