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~~SECRET~~ December 8, 1944

To: Dr. R. C. Tolman

From: W. A. Shurcliff

Subject: Analysis of the theses: (A) Maintaining secrecy on the details of the present weapon will not insure security. (B) Security will come from "keeping ahead".

Explanation: Some analysis of these theses appears called for since they lie at the heart of the general secrecy policy which, in turn, is fundamental to the entire postwar policy. These theses have been endorsed by many persons heard by the Committee. The writer knows of no one who has disagreed with these theses.

Conclusion: While it can be said that the theses are "more true than false", it is apparent that they are seriously inadequate and to an appreciable extent misleading, since:

With regard to Thesis A, maintaining secrecy will make for security for a good many years at least — especially with respect to the many smaller countries incapable of developing nucleonics weapons independently. To place one's faith in secrecy may be rash, but appreciably to dispense with secrecy may be even more rash.

With regard to Thesis B, even "keeping ahead" may prove futile when even "obsolete" nucleonics weapons can be employed by an enemy to wipe out our major centers, including nucleonics centers, in a single hour before declaration of war.

Part 1: Analysis of Thesis (A): "Maintaining secrecy on the details of the present weapon will not insure security".

The following arguments and counter-arguments are pertinent:

1. a. Argument: The details will gradually leak out through indiscretions.

b. Counter-argument: It is probably true that over a period of 2 to 20 years details will leak out as a result of indiscretions: locations of sites, purpose of sites, names of persons concerned, effectiveness of the weapon, general design of weapon, method of delivery. It may even be that the following data also will leak out: kind of active material used, amount of active material used, concentration of active material used, kind of tamper material, and perhaps even the kind of fusing.

However, even if much information is revealed to the enemy by such indiscretions, there will still be many difficulties standing in the way of his building an operative weapon — even assuming that he has a considerable quantity of enriched material. Specifically, he will lack many of the following:

detailed drawings of components and assemblies,

specifications of the purity requirements of enriched materials, and knowledge as to how to determine and control important impurities,

performance specifications and permissible tolerances of components,

knowledge of how to effect final assembly properly,

test facilities, and criteria of reliability.

c. Conclusion: Even if all the "popular interest" facts leak out through indiscretions — and many of the scientific facts also — there will probably be much highly-detailed engineering data which will not thus leak out.

2. a. Argument: The details will leak out through espionage.

b. Counter-argument: Same general counter-arguments apply here. Furthermore, counter-espionage should be of real assistance.

c. Conclusion: Although enemy spies may learn many details, much highly-technical engineering data will probably be beyond the reach of spies for many years — perhaps decades.

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Parenthetical note: The writer recalls many instances during 1943 and 1944 where, despite a wealth of fragmentary information from cooperative enemy prisoners, neutrals, and allied agents, the really significant technical engineering data on enemy devices remained wanting until uncomfortably late dates. Examples are: (a) technical characteristics of German infra-red search receivers and image tubes; (b) control frequencies for the German HS-293 glider bomb; (c) launching means, fuels, and radio control means of the German V-1 flying bomb. In all these cases the serious gaps in our knowledge were not filled until reasonably-intact specimens of the weapons in question had been captured. The abundance of such situations is believed to show that there is a good chance that appreciable amounts of highly-technical engineering data on secret devices may be kept out of enemy hands for years — perhaps decades.

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3. a. Argument: An enemy country may obtain detailed documents and even operative specimens of the weapon by gaining control of one of our allies to whom we have made disclosure.

b. Counter-argument: Presumably details will not be given to an allied country so weak as to have any appreciable probability of succumbing to an enemy country. Presumably we would come to the aid of such an ally and would prevent its succumbing. In any case arrangements might be provided ensuring destruction of the most secret documents and of the weapons themselves before capture.

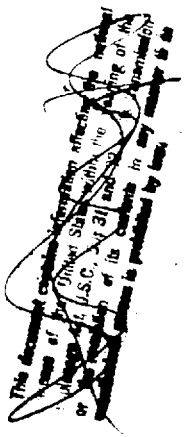
c. Conclusion: It seems unlikely that pertinent documents would fall into enemy hands in the manner postulates, and it seems very unlikely that the enemy should thus acquire operative weapons.

4. a. Argument: Even if the enemy does not learn from us how to make weapons of current type, he will soon rediscover for himself how to make similar or comparable weapons.

b. Counter-argument: Considering first technical factors, (1) the enemy country will be unable to marshall as many first-quality physicists and chemists as we have assembled; (2) the enemy will presumably work alone — without such assistance as we have obtained from our allies on scientific aspects, ore supply, P-9 facilities; and he will not benefit as we have from scientists from neutral or enemy countries; (3) the enemy will not have as extensive and advanced industrial facilities at his disposal as we have had.

Considering secondly administrative and secrecy factors: (1) the enemy — if his country is small and highly-populated — will have to locate his laboratories, plants, and proving grounds near populated centers, which will jeopardize secrecy and perhaps health also; (2) the enemy will presumably be making his development during peacetime, and thus will find it doubly difficult to maintain secrecy. There will be a certain number of foreigh diplomats, business men, scientists, students, sight-seers, etc. in his country at all times; foreign airplanes will occasionally make forced landings in forbidden areas; these and other circumstances will make it almost impossible for him to conceal the existence, magnitude, and locations of a project. Furthermore, since it is postulated that the period will be one of peace, it will be difficult for the enemy country to prevent his project personnel from indulging in a certain amount of traveling, and talking and corresponding with foreign scientists and relatives. Secrecy will be further endangered by needs for legislation and budget provisions, by publications practices, by filing patent applications. Further impairment of security might result from presence of foreign agents, from measurements of river temperatures, from measurements of radioactivity in fish in rivers or river outlet areas, etc.

6. Conclusion: A few other countries may have scientific, industrial, and mineralogical resources adequate for rediscovering weapons similar to or comparable to the current type. However, even in these few countries the development would probably take 5 to 20 years, and would probably not be concealed effectively unless general wartime-secrecy was maintained throughout the entire period of development. The less information such countries obtain from us, the longer their periods of development will be and the more difficult it will be for them to conceal the developments.



It is very important, however, to keep in mind the fact that very many countries — in fact the great majority of countries — may be kept innocent of effective weapons for 20, 50, or more years if we keep our knowledge secret.

Thus if security were to be proportional to the number of countries which remain innocent, the adoption of a policy of secrecy would increase our security from 0% to, say, 95% (for perhaps 20 to 50 years).

Stated differently, the mere fact that one or two countries may develop weapons independently in 10 years is no reason for our now releasing important details to all countries. This is especially true since even a small country — if it possessed a good store of weapons — could be a real danger to the largest countries, including U.S.A.

Part 2: Analysis of Thesis (B): "Security will come from keeping ahead"

1. a. Argument: By continually keeping ahead of other countries — through continually developing more effective weapons — we will maintain our security.

b. Counter-argument: Using the analogy of two men confined to a single bare room, each man carrying a machine gun, it is clear that if A pulls the trigger first, then A survives; B dies. The fact that B's machine gun was superior helped him none; it may even have made A more inclined to fire, and to fire at the first opportunity. Even if A's machine gun is so poor that B is not killed outright but is temporarily knocked unconscious, B is done for; he can be disposed of at A's convenience.

If our 1950 weapons are such that one of them is capable of eliminating a large city, then possession by the enemy of 20 such weapons might well lead to our instantaneous or more protracted downfall — even if we possessed hundreds of weapons of far greater effectiveness. For in a single hour preceding declaration of war the enemy could destroy our 10 principal nucleonics depots and our 10 largest cities. Furthermore, it is likely that the majority of the residents of the cities would not have taken adequate refuge and would be killed. Also, those not killed might suffer seriously from atomic poisons. Thus in one hour we might lose nearly all of our nucleonics strength, our ten largest cities, and 25,000,000 people (including a majority of the most important [redacted] political, administrative, military, and industrial personnel). The suddenness and magnitude of the disaster might cause us to give up without a fight. Even if our armies and navies were intact, it is doubtful whether they could fight for any appreciable length of time in view of the complete disruption of communications and production. Of course, the damaged areas would be wide open to attack by CW and BW agents.

If it is maintained that radar, fighter planes, etc. can detect and destroy the enemy's weapons or weapon carriers before they reach their targets, it should be pointed out that the enemy might well succeed in avoiding these defense measures by various technical means or by tricks. He might for example, deliver the weapon in a V-2-like carrier which might be launched from a submarine or even from a vessel disguised as a common freighter. Or the weapon might be dropped from a plane exactly resembling a commercial transport. If necessary — and to avoid the need for responding to demands for identification — the vessel or plane could

feign damage (or exhibit real damage) such as might prevent reception or transmission of radio messages. It is hard to imagine — too much to expect — that our peacetime defense forces would immediately attack and destroy an unidentified freighter which may be located 50 to 100 miles off the tip of Long Island and is proceeding slowly (in damaged condition in the middle of the night, in a rainstorm) towards New York City. It is more difficult to imagine our forces detecting (in the middle of the night; in a rainstorm; at 45,000 ft.) a stratosphere-type plane (resembling a U.S.A. or British transport) sufficiently early to permit proving the falsity of its forged radio-transmitted credentials and to permit shooting it down before it reaches New York City. (If only two or three defense planes went up to investigate the would-be transport plane, the latter might well shoot them down and then continue on to the target.)

c. Conclusion: Even although we might keep well ahead of all other countries in nucleonics weapons, it is quite possible that — in 1960, say — a hostile country could make a successful and decisive sneak attack on us if he had 20 or more weapons available similar to our "obsolete" 1950 weapons. "Keeping ahead" is probably desirable, but it will not ensure security.

Concluding Remarks:

We are entering an age (starting, say, in 1960) in which even inferior arms (e.g., 1950 nucleonics bombs) may be used suddenly to cripple and perhaps conquer the most advanced country. The coming age may be further characterized (in the following over-simplified and over-dramatic terms!) thus:

An age in which surprise aggression can laugh at military defense;
An age in which nucleonics is the grand currency of military negotiations;
An age in which our scientists will no longer be able to contribute to the defense of the country;
An age in which international physical compulsion is possible, but in which international physical conflict is impossible;
An age in which international conflicts can only be moral conflicts;
An age in which the line separating international disagreement between two countries from sudden devastation of one of them may become vanishingly thin;
An age in which "balance of power" and "threat" are merely historical terms.

If the last war was a chemists' war and the present war is a physicists' war, the next war may be an "administrator's war" -- a war whose outcome may be determined by the mere formulation and concealment of the administrative decision as to whether and when to strike.

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