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## CENTRAL INTELLIGENCE AGENCY

21 December 1959

## MEMORANDUM FOR THE BOARD

SUBJECT: Some Animadversions Regarding the Matter of the  
"Missile Gap"

1. Having for some time endured in silence, or near-silence, the pain occasioned by a quantity of talk about the dire implications of the "missile gap", I wish to seek relief. \* In this essay I lay no claim to knowing all the answers pertaining to this extraordinarily complex matter. I do lay claim to knowing that more answers are needed than are usually provided by those who speak positively regarding the implications of the "missile gap".

2. Theorizing about the "missile gap" begins with the affirmation that sometime in 1961 or 1962 the USSR will have a substantial number of ICBM's and the US will have few. So far as I know, this much is fact. From this point on, however, those who view with great alarm the implications of this fact make assumptions and net judgments of a sort which are usually described as "war-gaming". Now "war-gaming" does not produce incontestable facts. Indeed, inherent in its nature is a certain circular relationship between assumption and result which is notorious among professional practitioners of the war-game. As one eminent researcher in these realms, General Curtis LeMay, has said with characteristic plainness, "Tell me your assumptions

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\* The most recent and final stab of discomfort, leading directly to this outcry, was administered by the remarks attributed to Mr. Philip Mosely in Staff Memorandum 53-59, "Meeting of the Consultants at Princeton, 19 and 20 November."

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and I'll tell you your results." My view regarding the assumptions generally made by theorizers-of-the-missile-gap is that: (a) they ascribe perfection to the Russians and imperfection to ourselves; (b) they ignore or pass lightly over some hard military facts; and (c) they posit an extremely unlikely situation in the realm of international affairs.

3. Those who find extreme peril in the "missile gap" usually credit the USSR with having between 200 and 500 ICBM's operational in 1961 or 1962. It is true that our studies in NIE 11-8-59--to my mind the most sophisticated and thorough exercise as yet undertaken anywhere on this subject--have demonstrated that possession of such a number of ICBM's on launcher by 1961 or 1962 represents such an extraordinarily difficult achievement as to make it unlikely. But then we may be wrong, so let us proceed to the next point. These missiles, it is assumed, are targeted against the bases of the Strategic Air Command, and they are timed to arrive with perfect surprise on all these bases simultaneously. As a consequence, SAC is caught with its planes down, and the US nuclear retaliatory capability is obliterated or reduced to proportions which the Soviet air defense system can deal with, or can reduce again to proportions which make the level of damage it can inflict on the Soviet Union acceptable to Soviet planners.

4. The underlined phrases in the paragraph above represent points at which major assumptions must be made regarding the interaction in this hypothetical military engagement. We start, appropriately, with surprise--appropriately, because we shall see here and later, surprise is the absolutely essential element; without it the whole hypothetical construction comes apart.

5. It is fair to say that surprise, explicitly the danger of being surprised, is recognized by SAC as its most acute problem. In response, this superbly trained and equipped force, which

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has seldom lacked for funds, priorities, or elite personnel, has perfected complex, interlocking systems and procedures to guard against surprise. SAC is a jumpy and alert-happy force. There is little, if any, exaggeration in saying that if small fires were to break out simultaneously in the paint lockers of three or four SAC bases in the world, the bombers of the SAC alert force (numbering in the hundreds), bombed-up and fully fueled, would within approximately 15 minutes take off and head for their assigned targets in the USSR. After the several SAC base commanders had investigated the paint locker fires, and the possibility of sabotage as an accompaniment to Soviet attack had been set aside, the bombers would be recalled to base and new alert aircraft would take their place on the alert strips. So little as this has alerted SAC many times in the past and will do so again. I personally believe that there has never been a military force more difficult to surprise than SAC.

6. I have just mentioned the SAC ground alert force. Besides its capability for maintaining between one-fourth and one-third of its bombers on continuous 15-minute ground alert, SAC has a capability for airborne alert.\* At present, SAC can maintain a small percentage of its aircraft on continuous airborne alert and can, under emergency conditions such as a period of international tension, put substantial proportions of the force

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\* In this discussion, "15-minute ground alert" means that bomber aircraft, a requisite number of tanker aircraft, and their crews are at all times fueled, bombed-up, and briefed on specifically assigned targets. Five minutes after the alert is sounded the first alert aircraft leave the runway; the rest of the alert force gets off at intervals of one to two minutes. "Airborne alert" means that a percentage of the force is kept constantly aloft, shuttling out and back part way along the assigned routes to the designated targets.

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on airborne alert for several days at a time. The point about all this is that no number of ICBM's can destroy a SAC bomber once it is airborne and en route to its target. SAC can, therefore, frustrate the assumed Soviet missile superiority at any time by putting its cocked aircraft aloft. The percentage of the alert force which is aloft at the hypothetical moment when the Soviet missiles detonate on SAC bases is approximately the percentage with which the Soviet air defense system will have to cope, and this we will discuss later.

7. Here, however, we may note in passing a secondary point regarding the assumed simultaneous arrival of the Soviet missiles on target. At present there exists considerable skepticism among technical experts regarding the feasibility of causing several hundred missiles, originating from points hundred of miles apart, to impact simultaneously on targets also hundreds of miles apart. This skepticism derives largely from a detailed understanding of the enormous complexity and technical uncertainty of the missile at the stage of its development anticipated between now and 1962. But there is also available to anyone who lives in the real world another source of healthy skepticism. Human affairs, as we note daily while searching for misplaced car keys or balancing unbalanced check-books, are constantly going askew. When these affairs are military in nature, this tendency, as historians have recorded and those of us who were adults by 7 December 1941 have observed, reaches new heights. As [redacted] is credited with noting in Staff Memorandum 53-59, the Soviet military operation envisaged by the missile-gappers surpasses in scope and perfection any military operation in history. Unless we assume such perfection in the matter of simultaneity, however, we must admit that when approximately five minutes pass between the arrival of the first Soviet ICBM anywhere in the US and the first detonation on any given SAC base, the alert bombers will begin taking off from that base and others will follow every passing minute. This number, its size dependent upon the number

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and length of the time intervals involved, must be added to the number which will confront the Soviet air defense.

8. Now we turn to the second major assumption underlined in paragraph 3: the assumed capability of the Soviet air defense to deal with the SAC bombers not destroyed by ICBM's. I suppose that the effectiveness of air defense against jet bombers ranks, along with the efficacy of airborne electronic countermeasures, as the most vexing and disputed question confronting military planners these days. The air attack-defense equation is extremely complex and constantly shifting, and in the absence of testing under combat conditions no one has any definitive data. Among those who study these matters there is general recognition, however, that the USSR has been investing heavily in air defense. This awareness has caused SAC to intensify its effort to devise equipment and techniques which will augment its ability to penetrate the Soviet air defense. As a consequence, SAC has developed the capability to mount an assortment of attacks, variously designed to exploit the inherent vulnerability of air defense systems to low-level approaches, deception, saturation by mass, stand-off weapons, and airborne electronic countermeasures. It may be that in time the manned aircraft will be no match for air defense missiles, but at present two techniques provide considerable assurance that within the 1961-62 period the balance will not swing wholly against attack: (a) the use of low-level approaches to the target, combined with specially designed weapons permitting the aircraft to stay low throughout its bombing run; and (b) the use of long-range (300-400 miles) air-to-surface missiles with nuclear warheads for blasting out air defense sites. Another tactic which could degrade the effectiveness of air defense is use of the so-called dead-man fuse. This is a device which causes the nuclear weapon aboard a shot-down aircraft to detonate upon impact. These weapons would not of course land on their assigned targets but they would in most cases land on Soviet soil. Each one, be it remembered, would be a multi-megaton detonation.

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9. The importance of all this, in relation to the missile-gap problem, is that in this hypothetical situation the odds are favorable for some SAC bombers to get their bombs down on the USSR. No one to my knowledge ever postulates that all the attacking bombers will be shot down by the air defense. The attrition factor frequently employed in professional war games ranges from 50 to 80 percent. Some bombers always get through. My own view is that a sizeable fraction of the attacking force-- say, about one-third--would probably get through in this assumed situation.

10. This brings us to the third major assumption underlined in paragraph 3: the assumed willingness of Soviet planners to accept indeterminate amounts of nuclear damage. Here, of course, we enter an area where nothing is known. I feel confident in saying that even in the USSR no one--not even Mr. K.-- knows how much nuclear damage would be acceptable. But one thing does seem certain on this question, and that is that those who easily assume that the USSR would willingly accept a quantity of nuclear damage are guilty of a major failure in constructive imagination. Up to the present, fortunately, no one has observed the effect of a multi-megaton detonation on a modern city, let alone the effect of a number (10? 100? 1000?) of such detonations on a modern country. We do know that the havoc and chaos at Hiroshima was indescribable. But then, one might answer, Moscow is not Hiroshima and the Russians are not Japanese. To this one must rejoin, yes, but we are no longer talking about 20 kiloton weapons.

11. It is sometimes argued by the missile-gappers that the Russians in World War II displayed considerable fortitude in accepting millions of casualties and therefore might willingly accept a couple of million again. To me, this comparison is utterly irrelevant. In the first place, in this situation the Soviet leaders are assumed to be deliberately accepting casualties of this order. In World War II, if I remember correctly, they were

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attacked first and their casualties were sustained while repelling an invader. But far more important, to sustain casualties on a demarcated military front on a day-by-day basis over several years time is vastly different from sustaining such casualties over an entire country in a matter of hours. The impact of an airborne nuclear attack of multi-megaton weight on the complex mechanisms of modern civilization would be most profound. The shock to the population of millions of simultaneous casualties would transcend anything the world has seen. I personally doubt that the Soviets could willingly accept just one 10-megaton detonation on Moscow. In this hypothetical situation, they would be risking the receipt of scores and hundreds of multi-megaton weapons, not only on Moscow but widely throughout the country they have struggled so to modernize during the past forty years.

12. This brings us, it seems to me, to the very nub of the matter--the risk and the degree of assurance attending the risk. Before initiating the attack posited by the missile-gap theorists, the Soviet planner would have to assess the degree of assurance he could obtain that the US retaliatory attack would not inflict on the Soviet Union some unspecified amount of damage. How much assurance could he get? In dealing with this question, one ought to make every effort to see the problem from the Soviet point of view--from a point of view, in short, which permits one to see the enormous strengths, as well as the weaknesses, of the US nuclear delivery capability, and one from which one can see the possibility that the Soviet attack might not go off exactly as planned. No military planner I have ever met wants to set up a military operation without lots of assurance of success. They all want to be very sure.

13. As the Soviet military planner surveys the problem before him, what does he see? First of all, he sees the SAC bomber force, possessing the biggest punch of any military force in history. To defeat it, he must surprise it. Not just partly surprise it, but completely surprise it. This means he must

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caution his political superiors that a period of political relaxation is essential for his purposes. During a period of international tension, he has no assurance that he can surprise SAC. Moreover, to think of making an attack after a blackmail attempt horrifies him. Threats, maybe; an actual attack, no. SAC would certainly be alerted and substantial numbers of its bombers airborne. He must have complete quiet.

14. Mindful of his need for surprise, the Soviet military planner is disturbed also by the reports he has received about the US Ballistic Missile Early Warning System. Some of his experts are skeptical that the US BMEWS could function rapidly enough to permit SAC to get the ground alert force airborne. He knows, however, that the system was designed to give warning of the firing of ICBM's in the first minutes of their approximately 30-minute flight. For a man who has considerable respect for the electronic ingenuity of the Americans and who is searching hard for assurance regarding surprise, this is disturbing. He finds it hard to be sure.

15. Next, the Soviet military planner looks at the US ICBM capability. It is not, by his assumed standards, large, and it is in 1961 mostly soft-sited. But again he appreciates the need for surprise, because alerted American missiles can be held for long periods of time on a 15-minute, or less, posture of readiness. He also knows that any which are not hit on his first salvo will be fired and once on their way cannot be stopped. Similarly, he knows that the US Polaris-equipped submarines are operational at this time, and each submarine carries a load of 16 missiles with nuclear warheads. His chances of averting a Polaris attack are negligible; the damage his country will almost certainly receive is far from negligible.

16. Finally, he turns his attention to the US Sixth Fleet in the Mediterranean and the US Tactical Air Command in Western

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Europe. The threat represented by these forces is not really large by the appalling standards of the nuclear era, but the forces are there and the Soviet planner must have some assurance that they will be dealt with. He recognizes at the very least that severe problems of timing are presented by his necessity to launch strikes at a large number of targets in Western Europe and its periphery, such strikes to arrive simultaneously with the ICBM's on North America. He realizes also that the preparations necessary to take out these forces may jeopardize his attainment of surprise and without surprise he cannot succeed.

17. Having made his survey of the forces opposing him, what does the Soviet military planner conclude? I believe that even if he gives himself the highest degree of assurance military planners ever use, 90 to 95 percent, and grants himself the achievement of complete surprise, he will still face some discouraging conclusions. He will find as he tots up the nuclear megatonnage that he cannot be sure of warding off--the fraction of the SAC force that is airborne or escapes damage, the ICBM's he does not hit, the Polaris submarines, the carrier-based jet aircraft, the TAC fighter-bombers--that a megaton here and a megaton there add up to a significant total. I personally believe that the total figures of our assumed planner would approximate 100 megatons, at the very least. To be sure, these megatons would not all be delivered on target, but the Soviet planner recognizes that whereas the attacker needs precise accuracy for success the defender needs only enough to cause substantial damage. He knows that 100 megatons delivered even at random on the USSR would cause enormous damage. I do not see how any responsible Soviet military planner could obtain assurance--solid, militarily-defensible assurance--that the level of damage from the US retaliatory attack would be less. I therefore believe that this planner, and anyone else who looked hard at the military realities, would strongly advise against the launching of the assumed attack in 1961 or 1962.

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18. Suppose one accepts the contention that possession by the USSR in 1961-1962 of a superior number of ICBM's does not necessarily have the dire implications drawn from it by some observers. Does this permit us to be complacent about the Soviet ICBM capability? Far from it. I think that the present Soviet ICBM capability and the probable achievement of a numerical superiority in 1961 or 1962 have profound significance in the US-Soviet power balance. The Soviets now have positive assurance that they can inflict enormous and crippling damage on the US under any of the circumstances which may precipitate general war. This, I think, is the true and accurate meaning of their ICBM capability, and it has wide-reaching implications. The Soviets are now liberated from the one-sided threat of our enormous nuclear capability. For people afflicted with deep feelings of inferiority this is extraordinarily important. It bestows greater flexibility on their use of military power to obtain objectives. Likewise, since their possession of an "equalizer" accords them the status of an equal, to say the least, they are enabled to pursue policies of relaxation without fear they may appear to be supplicants. The powerful can afford to appear benign. I expect that Soviet policy henceforth will be far more menacing, when it is menacing, and far more conciliatory when it is conciliatory. I expect it to be free-swinging and hard to handle. But I do not expect it, suddenly on some quiet day, to seek fulfillment of its ambitions in a single gigantic gamble, when the odds for complete success are not great and the potential losses are catastrophic.

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