


UNCLASSIFIED

INTERNAL NOTE NO. N-172

A COMMENT ON FUTURE WEAPONS SYSTEMS (U)

(Letter to Charles Herzfeld, ARPA,
and George Rathjens, ACDA)

by

J. P. Ruina

JUN 24 1993

THIS DOCUMENT HAS BEEN DOWNGRADED



TO UNCLASSIFIED

Per Director ARPA S#IO/Tio

September 3, 1964

JASON DIVISION
INSTITUTE FOR DEFENSE ANALYSES

UNCLASSIFIED



IDA/HQ 64-2965

Copy 1 of 1 copy Series
B

~~TOP SECRET~~
CONFIDENTIAL
MAR 2 1990

This document contains information affecting
the national defense of the United States
within the meaning of the Espionage Laws,
Title 18, U.S. Code, Sections 793, and 794.
The transmission or the revelation of its con-
tents in any manner to an unauthorized
person is prohibited by law.

~~CLASSIFIED BY YEAR INTER-
AUTOMATICALLY
CLASSIFIED BY DIR 5200.10~~

UNCLASSIFIED

September 3, 1964

Dr. Charles Herzfeld
Deputy Director
Advanced Research Projects Agency
Room 3E160
The Pentagon
Washington 25, D. C.

JUN 24 1993

THIS DOCUMENT HAS BEEN DOWNGRADED

TO UNCLASSIFIED

Per Director ARPA SETO/TIC

and

Dr. George Rathjens
Deputy Assistant Director
Science & Technology Bureau
US Arms Control and Disarmament Agency
21st Street and Virginia Avenue
Washington 25, D. C.

Dear Charlie and George:

After the conversations I had with you earlier this summer, some of us did think some about new strategic weapons systems and tried to assess how our thoughts now, about what's coming up, differ from what they were two or three years ago.

It seemed clear to me that for Jason to go through a complete list of all suggested developments which, as you know, range from the reasonable to the ridiculous would not be fruitful. Also, only to be critical of some of the more outlandish weapons systems inventions at this time is not even fun, and surely not fruitful, now that the government itself is so much more intelligent about these things and is clearly no longer prone to believe in the technologically naive inventions, no matter how imaginative they may be. What I did do was to gather Dyson, Gell-Mann, LeLevier and myself to discuss, on the basis of our past knowledge generally and a recent exposure to some of Aerospace's thinking, what the future weapons systems' situation is. I would like to convey to you some of our thoughts and conclusions, no matter how tentative and incomplete they may be.

To start with, I should tell you that we are very impressed with the soundness of the Aerospace briefings. These contrasted greatly to what I had expected and to what I had heard from the

UNCLASSIFIED

[REDACTED]

UNCLASSIFIED

Dr. Charles Herzfeld
Dr. George Rathjens

Page 2
September 3, 1964

Air Force in my Pentagon days when Microwave Radiation weapons and Bambi were so prominent. On the other hand, the strategic views of the Aerospace group were rather narrow. In considering the strategic implications of their projected defense, they did not, for example, include Polaris. In considering what inhibitions there may be in U.S. strategic weapons developments they did not consider the national image, deterrent creditability, national policy, and possible treaties that the U.S. may have; but only considered such inhibitions as the Secretary-of-Defense-imposed budget limits or booster quantity limits.

In regards to the "exotic" weapons systems, our reaction is not really any different from what it was two or three years ago. Although these systems have changed in detail they do not seem to have more nor less promise than before, which means that no doubt most if not all of them are doomed to failure for one reason or another. Surely there is some chance that one of these may prove feasible, but I'm not holding my breath waiting for any of them. (In regard to "exotics" you will find Christofilos' paper on a Space Fleet which he wrote this summer at Jason, very interesting).

In the conventional ABM versus offensive missile dual, we feel that whereas in the days of Nike-Zeus the issue was whether the defense system could work at all against an attack designed to cope with it, in contrast now, considering the possible inclusion of a hot bomb in the defensive interceptor and considering what we know about penetration aids and reentry, Nike-X offers a very substantial challenge to an offensive system. Although I think the defense is still clearly the underdog and it can without doubt still be defeated by a determined and sophisticated attack even if only by methods which exhaust the defensive missile supply, the match is not a trivial one to evaluate. On this score you are probably much better versed than we and I am sure you have your own educated conclusions and prejudices.

[I would like to add as a footnote here my personal view that in order to realize, in the operational inventory, strategic systems with truly effective penetration capability, we will have to have a program dedicated to this end with the same kind of national commitment and dedication that we had in the Atlas, Polaris, and Minuteman programs.]

UNCLASSIFIED

[REDACTED]

[REDACTED]

UNCLASSIFIED

Dr. Charles Herzfeld
Dr. George Rathjens

Page 3
September 3, 1964

The new thing on the horizon which should be taken very seriously is the development of very low C.E.P.'s in an ICBM force. This reduces the yield requirements for counterforce capability very dramatically thereby making various new developments feasible and attractive. Foremost of these is what the Air Force calls MIRV (Multiple Independent Reentry Vehicles) -- a development that is clearly feasible although it will no doubt have its engineering difficulties.

With no limits on the size or nature of the U.S. nuclear arsenal, MIRV only provides a cheaper way of doing what might be desirable. But given some limitations for any reason whatsoever, the possible use of MIRV can make a qualitative difference in capability. (Use for counterforce is most obvious, but MIRV can also be used to complicate the problem for defense. The coming Penetration X study should surely include MIRV's role in countering defensive systems.)

A systematic study of the implications of MIRV under various limiting conditions for the U.S. and S.U. arsenals ought to be undertaken. Perhaps this should be part of a more general study which tries to assess the effect various constraints in the form of treaty prohibitions, inspection requirements, etc., have on the arms race and what constraints tend to have the arms race become more or less stable, etc.

But Jason is not the organization to carry out this kind of study since Jasonites are part-time and work sporadically. However, if IDA should undertake such a study, individual members of Jason can and should make a substantial contribution.

Another topic with which a new study might concern itself is the long range implications of military space activities. It is especially important to try to determine whether any conceivable space reconnaissance systems may make a decisive difference to the chances of arriving at lasting strategic stability or control of the arms race. If such systems appear

UNCLASSIFIED


UNCLASSIFIED

Dr. Charles Herzfeld
Dr. George Rathjens

Page 4
September 3, 1964

to exist, they should be included as an integral part of any study of the future of the missile forces. It is likely that in the long run the size of missile forces will depend more on the quality of the intelligence data available to the governments concerned than on the characteristics of the missiles themselves.

Sincerely yours,

J. P. Ruina

J. P. Ruina

JPR:mi

cc: Marvin L. Goldberger
Kenneth M. Watson

P.S. This letter was written before I knew I would return to Washington and IDA full time.

UNCLASSIFIED



**NATIONAL
SECURITY
ARCHIVE**

This document is from the holdings of:

The National Security Archive

Suite 701, Gelman Library, The George Washington University

2130 H Street, NW, Washington, D.C., 20037

Phone: 202/994-7000, Fax: 202/994-7005, nsarchiv@gwu.edu