

TWX to General Starbird - Thoughts in Connection with Test Moratorium

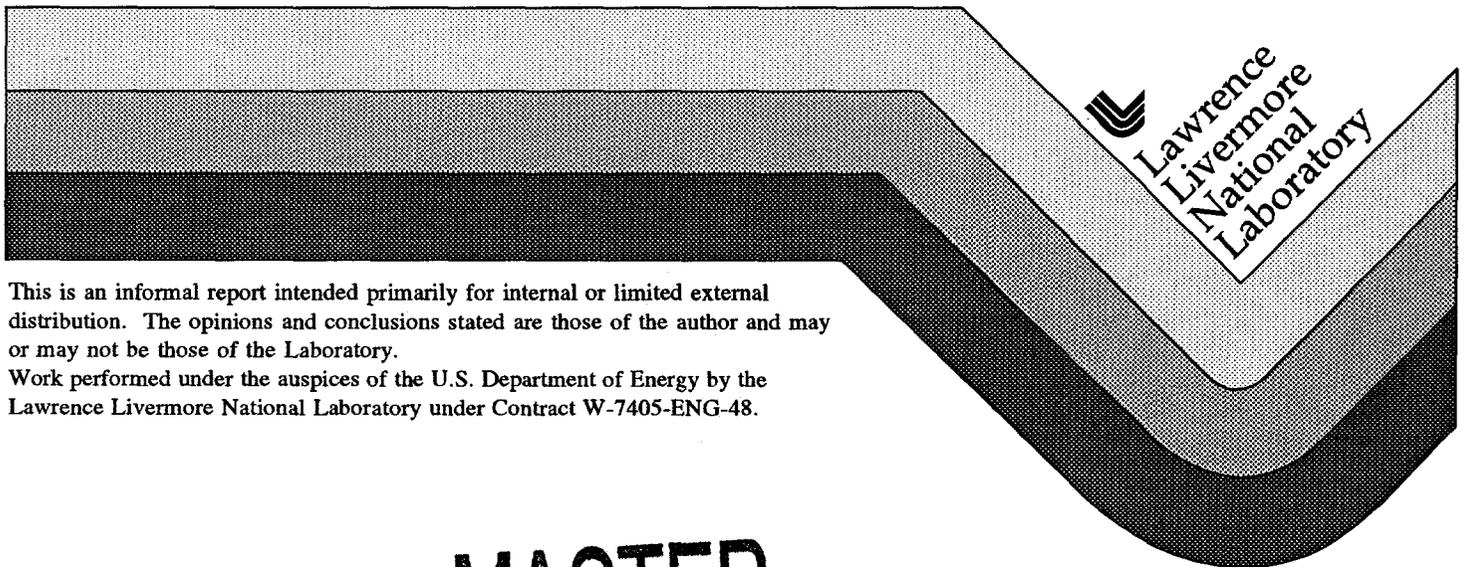
E. Teller

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August 29, 1958



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U. S. ATOMIC ENERGY COMMISSION
OUTGOING TELECOMMUNICATION MESSAGE

4/24

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FROM:

Edward Teller
UCRL, Livermore

OFFICIAL BUSINESS

R. Sewell
(Signature of certifying official)

PRECEDENCE DESIGNATION

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PRIORITY

TO:

DOCUMENT NUMBER

DATE OF MESSAGE:

Brig. Gen. A. D. Starbird, Director
Division of Military Application
U. S. Atomic Energy Commission
Washington, D. C.

August 29, 1958

8-3605

ansd by Starbird
9/1/58 - L-2196(5-47)

WE WOULD LIKE TO SUBMIT THROUGH YOU TO THE COMMISSION SOME OF OUR THOUGHTS
IN CONNECTION WITH THE TEST MORATORIUM. THE PURPOSE IS IN PART TO CLARIFY LABORATORY
PLANS AND IN PART TO POINT OUT DANGERS IN CONNECTION WITH FUTURE DISCUSSIONS CON-
CERNING THE TEST MORATORIUM. THE FOLLOWING IS IN FIVE PARTS.

PART ONE.

THE LABORATORY WILL SUBMIT IN THE NEAR FUTURE PLANS FOR OUR PLOWSHARE PROGRAM.
WE EXPECT THESE PLANS TO INCLUDE, FIRSTLY, SHOTS DESIGNED FOR SPECIFIC PEACEFUL
ECONOMIC PURPOSES USING TESTED DEVICES, SECONDLY, TESTS AIMED AT THE DEVELOPMENT OF
DEVICES ADAPTED TO SPECIFIC PEACEFUL USES (SUCH AS, FOR INSTANCE, DITCH DIGGER),
AND, FINALLY, TESTS AIMED AT OBTAINING SCIENTIFIC INFORMATION, SUCH AS DATA ON
NUCLEAR PHYSICS AND HIGH PRESSURE PHYSICS FROM UNDERGROUND TESTS AND SCIENTIFIC
INFORMATION ON PHYSICS OF THE HIGH ATMOSPHERE FROM HIGH ALTITUDE SHOTS.

ACTUALLY A SINGLE PLOWSHARE SHOT MAY COMBINE SEVERAL OF THESE EXPERIMENTS. IN
CONFORMANCE WITH THE LETTER AND THE SPIRIT OF THE PRESIDENT'S ANNOUNCEMENT, WE PLAN
NOT TO INCORPORATE ANY FEATURE OF SPECIFICALLY MILITARY SIGNIFICANCE INTO THESE TESTS.
WE SHALL PROCEED ALONG THESE LINES UNLESS WE RECEIVE INSTRUCTIONS TO THE CONTRARY.

ORIGINATOR:

Teller:gg
8/29/58
1:00 p.m.

THIS SPACE RESERVED FOR COMMUNICATION CENTER ACTION			
MSG. NO.	GR.	DTG.	
TRANSMISSION MEANS			
DIRECT TWX	TWX AND MILITARY	DIRECT MILITARY	W. U.

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Classification: Security classification category to be imprinted at top and bottom of page.

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Continuation Page: Use Form 321 a for second and succeeding pages. Type name of addressee, page number in Arabic numerals, and date in appropriate spaces.

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Authority of R2D2-10480 5/21/96 (date)

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U. S. ATOMIC ENERGY COMMISSION

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TO: General Starbird

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PART TWO.

ACCORDING TO THE PRESIDENT'S DIRECTIVE THE LABORATORY MUST CONTINUE RESEARCH AND DEVELOPMENT OF NUCLEAR WEAPONS. IN ORDER TO COMPLY WITH THIS DIRECTIVE WE SHALL HAVE TO PERFORM SOME EXPERIMENTS AND WE WILL HAVE TO UNDERSTAND THE CRITERIA ACCORDING TO WHICH A CERTAIN OPERATION IS CONSIDERED AN EXPERIMENT RATHER THAN A TEST. AN EXPLOSION IN WHICH THE NUCLEAR ENERGY PRODUCTION IS NOT MORE THAN THE ENERGY PRODUCTION BY THE HIGH EXPLOSIVE IS OBVIOUSLY NOT A TEST OF A NUCLEAR WEAPON AND SHOULD CERTAINLY BE PERMITTED AS AN EXPERIMENT. SUCH EXPERIMENTS COULD AND SHOULD BE PERFORMED UNDERGROUND AND BE COMPLETELY CONTAINED.

PART THREE.

EXPLOSIONS BELOW A KILOTON CANNOT BE DETECTED AND IDENTIFIED BY ANY OF THE ANY OF METHODS CONSIDERED REALISTIC BY/THE DELEGATIONS AT THE GENEVA CONFERENCE. WE THEREFORE PROPOSE THAT EXPLOSIONS OF MILITARY SIGNIFICANCE BELOW A LIMIT OF AT LEAST ONE HUNDRED (100) TONS BE PERMITTED. THESE EXPLOSIONS WILL BE IMPORTANT FOR OUR FUTURE WEAPONS DEVELOPMENT.

PART FOUR.

THE DETECTION OF UNDERGROUND EXPLOSIONS DEPENDS ON THE EARTH MOVEMENT PRODUCED AT GREAT DISTANCES BY THESE EXPLOSIONS. THE MAGNITUDE OF THIS EARTH MOVEMENT DEPENDS ON THE EXPLOSIVE POWER RELEASED AND ON THE FRACTION OF THE ENERGY COUPLED INTO SEISMIC WAVES OF LONG WAVE LENGTH. THE DISCUSSIONS IN GENEVA HAVE NOT GIVEN SCIENTIFICALLY CREDIBLE ANSWERS ON THIS POINT. WE BELIEVE THAT NO REALISTIC AGREEMENT CAN BE REACHED WITHOUT PERFORMING SOME UNDERGROUND SHOTS IN ORDER TO CLARIFY THESE QUESTIONS,

U. S. ATOMIC ENERGY COMMISSION

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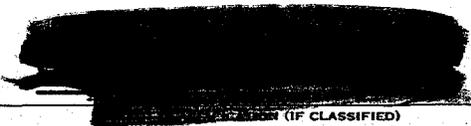
WE SHALL MAKE EVERY EFFORT TO GET THE NEEDED INFORMATION FROM THE SHOTS WHICH WE WILL FIRE BEFORE OCTOBER 31. WE BELIEVE, HOWEVER, THAT THIS INFORMATION WILL BE INSUFFICIENT AND THAT MORE SHOTS WILL HAVE TO BE FIRED IN ORDER PROPERLY TO STUDY EARTHQUAKE EFFECTS.

FURTHERMORE, IT IS POSSIBLE TO ENGINEER UNDERGROUND SHOTS IN SUCH A WAY AS TO MINIMIZE EARTHQUAKE EFFECTS. IT IS PROBABLE THAT IN THIS MANNER PROCEDURES CAN BE FOUND WHEREBY LARGER AND LARGER UNDERGROUND SHOTS CAN GO UNDETECTED. WE BELIEVE THAT FURTHER SHOTS ARE NEEDED TO EXPLORE THIS POSSIBILITY.

WE ARE PROCEEDING WITH THEORETICAL INVESTIGATIONS CONCERNING THESE QUESTIONS, BUT WITHOUT EXPERIMENTS THE CONCLUSIONS WILL REMAIN UNCERTAIN. WE BELIEVE THAT EXPERIMENTS WITH NUCLEAR EXPLOSIVES ARE NECESSARY IF MEANINGFUL STATEMENTS ARE TO BE MADE ABOUT THE YIELD OF UNDERGROUND SHOTS WHICH CAN BE DETECTED RELIABLY BY A GIVEN SYSTEM OF OBSERVATION STATIONS.

PART FIVE.

WITH RESPECT TO THE NEGOTIATIONS WHICH ARE TO TAKE PLACE AFTER OCTOBER 31, WE SUGGEST THAT ONLY SUCH AGREEMENTS BE MADE WHICH CAN BE EFFECTIVELY CHECKED. UNFORTUNATELY AT THE GENEVA DISCUSSIONS STATEMENTS WERE MADE ABOUT YIELDS RATHER THAN ABOUT OBSERVABLE EFFECTS. EVEN MORE UNFORTUNATELY THE POPULAR UNDERSTANDING OF THE GENEVA AGREEMENTS IMPLIES THAT ALL TESTS CAN BE ^{DETECTED} ~~IDENTIFIED~~ AND IDENTIFIED. THIS IS DEFINITELY NOT TRUE. BELIEVING THE EXTREMELY OPTIMISTIC FIGURES OF THE GENEVA MEETING WE WOULD NEED MANY THOUSANDS OF STATIONS IF ALL UNDERGROUND DETONATIONS OF ONE HUNDRED (100) TONS OR LESS ARE TO BE DETECTED. FURTHERMORE, INTENTIONAL DECOUPLING OF EXPLOSIONS FROM EARTHQUAKE EFFECTS HAS NOT BEEN TREATED SATISFACTORILY.



(IF CLASSIFIED)

U. S. ATOMIC ENERGY COMMISSION

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WE THEREFORE SUGGEST THAT ANY FUTURE AGREEMENT SHOULD NEITHER LIMIT NOR PROHIBIT TESTS, BUT RATHER SHOULD SET LIMITATIONS UPON THE EFFECTS TO BE PRODUCED BY FUTURE TESTS. IT SHOULD BE MADE LEGAL TO PERFORM NUCLEAR TESTS WITHIN THESE LIMITATIONS.

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