

June 11, 1957

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E.O. 12958, Sec. 3.8

ATOMIC ENERGY COMMISSION

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NW 972006A
By DM LR Date 7/27/05

ESTIMATES OF YIELDS OF NUCLEAR TESTS

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Note by the Secretary

The General Manager has requested that the attached exchange of letters with the Chairman, Special Subcommittee on Radiation, JCAE, be circulated for the information of the Commission.

W. B. McCool
Secretary

REPOSITORY NARA - College Park
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DEPARTMENT OF ENERGY DECLASSIFICATION REVIEW	
DOE ORDER 5650.2	
REVIEW DATE: <u>7/20/95</u>	REVIEWER: <u>[Signature]</u>

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REVIEW DATE: <u>06/13/02</u>	1. DETERMINATION (CIRCLE NUMBER(S))
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NW 972006A
By DM/TR Date 7/27/05

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ENCLOSURE I

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON 25, D. C.

June 4, 1957

Honorable Chet Holifield
Chairman, Special Subcommittee
on Radiation
Joint Committee on Atomic Energy
Congress of the United States

Dear Mr. Holifield:

This is in response to Mr. Ramey's verbal request of June 1, 1957, for a classified summarization of estimated fission and total yields from tests by the U.S., the U.K., and the U.S.S.R.

This information is attached. The listed values for the total yield of the British and Russian shots are the best estimates of the Joint Atomic Energy Intelligence Committee.



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Please let us know if we can be of further assistance to you.

Sincerely yours,

/s/ K. E. Fields

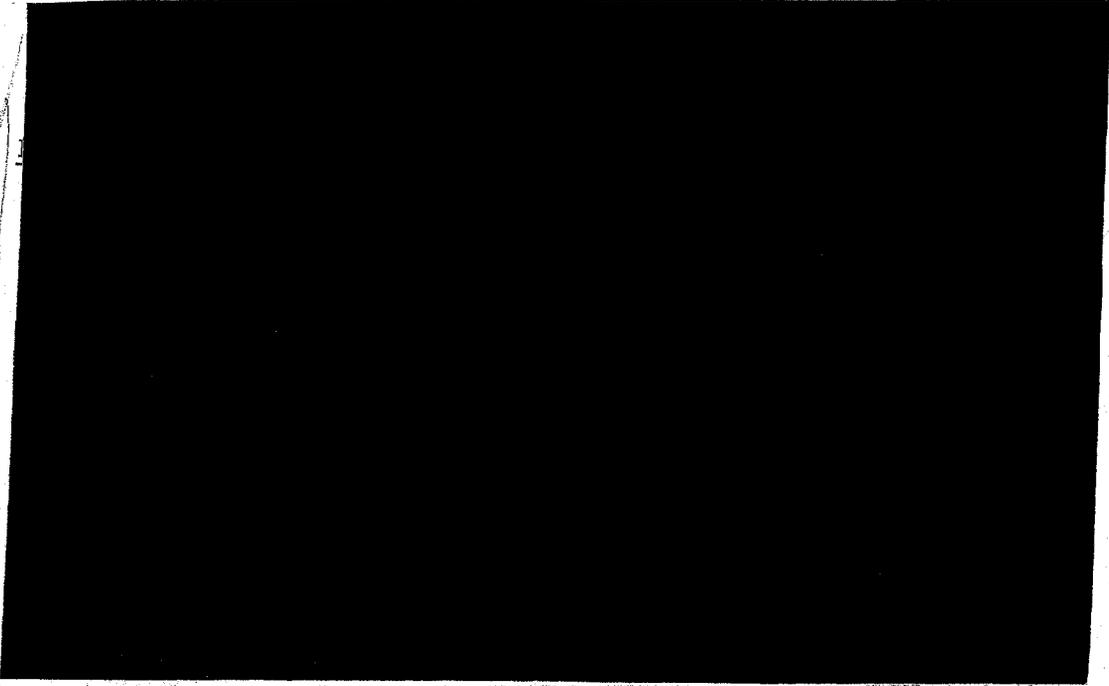
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ENCLOSURE II



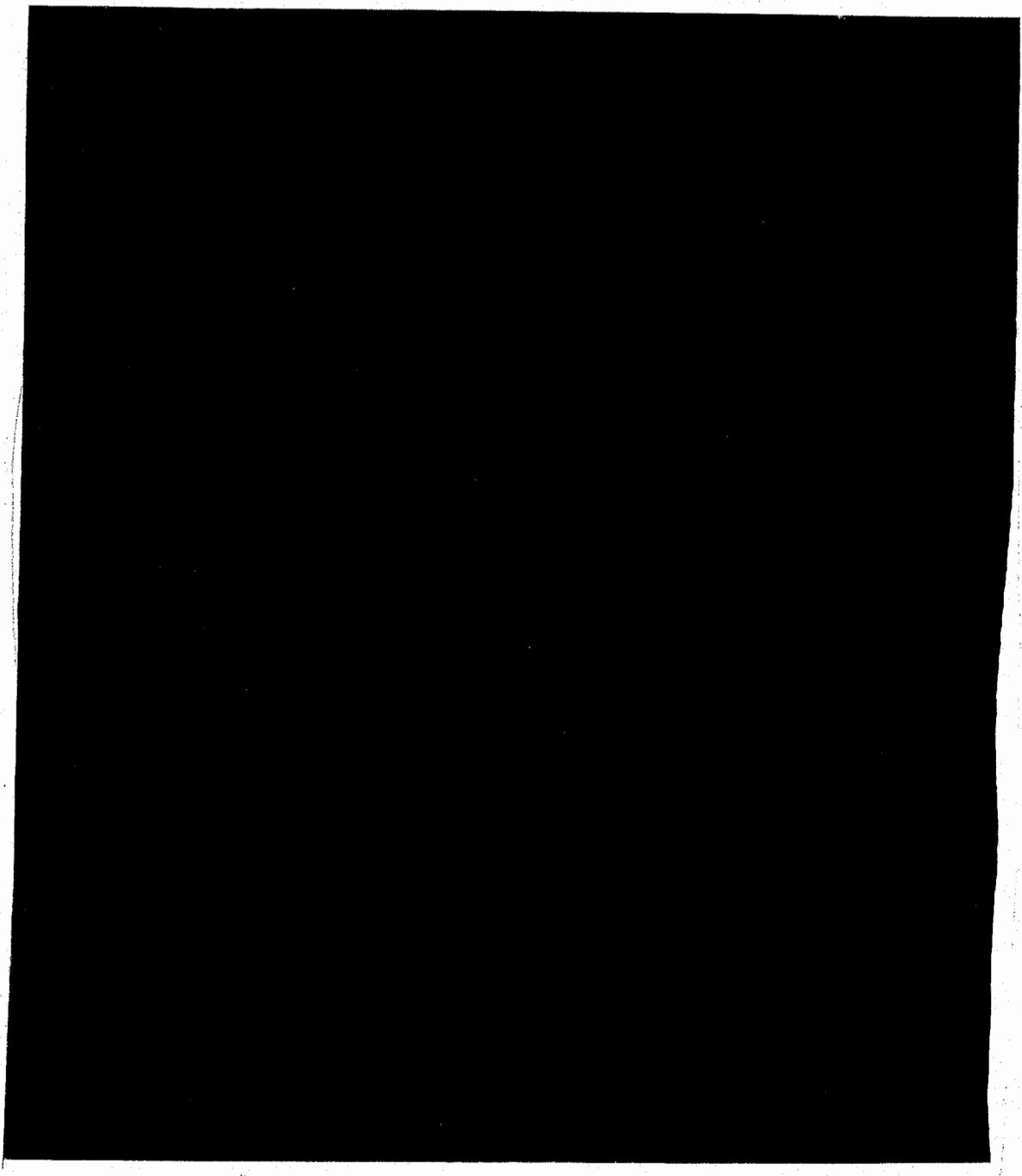
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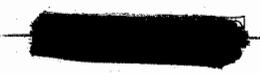
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ENCLOSURE III



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ENCLOSURE IV

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON 25, D. C.

1 June 1957

Honorable Chet Holifield
Chairman, Special Subcommittee
on Radiation
Joint Committee on Atomic Energy
Congress of the United States

Dear Mr. Holifield:

Your letter of 31 May 1957 requests a letter on an unclassified basis giving: (a) an estimate as to year-to-year fission yield and total yield put into the atmosphere by atomic weapons from all sources; (b) a list of weapons test series conducted by each country; and (c) a listing of the number of explosions which have taken place country-by-country and year-by-year.

As to total yield and total fission yield released by tests to date either in gross or by nation, this information has security implications which preclude my giving it as unclassified data. Various unclassified estimates which do not reveal such totals have been made as to the amount of fission debris making its way into the stratosphere. One such estimate is that given on pages 952 and 954 of the attached report, "Current Research Findings on Radioactive Fallout," by Dr. Willard F. Libby.

Information as to U. S. test series and the number of shots in each is contained in the following table:

<u>Name of Series</u>	<u>Date</u>	<u>No. of Shots</u>
TRINITY	1945	1
CROSSROADS	1946	2
SANDSTONE	1948	3
GREENHOUSE	1951	4
RANGER	1951	5
BUSTER/JANGLE	1951	7
TUMBLER/SNAPPER	1952	8
IVY	1952	2
UPSHOT/KNOTHOLE	1953	11
CASTLE	1954	*
TEAPOT	1955	14
WIGWAM	1955	1
REDWING	1956	*
PLUMBBOB	1957	1**

* The number of shots in CASTLE and REDWING is still classified.

**Only one shot to date.

The above list is exclusive of the two weapons detonated in combat during World War II.

With respect to the British series, the United Kingdom has announced the following series and number of shots:

<u>Location</u>	<u>Date</u>	<u>No. of Shots</u>
Australia	1952	1
"	1953	2
"	1956	2
"	1956	4
Christmas Island	1957	2

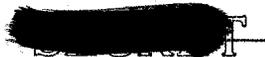
Of several Soviet references to their tests, they have announced one on 20 August 1953, shortly before the U. S. announcement was issued; made a general statement on 18 September 1953 to the effect that they had conducted several tests in recent weeks which constituted confirmation of the U. S. announcement of 31 August 1953; and announced a test on 10 September 1956 about which the U. S. made no comment. The United States has from time to time announced certain of the tests. Copies of these announcements are attached. From a review of these announcements it can be noted that the U. S. has announced 23 specific USSR detonations. A complete list of all detected shots cannot be provided on an unclassified basis. In this respect on August 26, 1956, the Chairman of the AEC stated: "Although there have been but 13 announcements by the U. S. regarding Soviet testing, several have noted a series of detonations and the actual number of Soviet detonations is significantly higher than 13."

Should you desire a classified summarization of the information requested which cannot be given on an unclassified basis, I would be most pleased to provide this separately.

Sincerely yours,

/s/ K. E. Fields

General Manager



ENCLOSURE V

CONGRESS OF THE UNITED STATES
JOINT COMMITTEE ON ATOMIC ENERGY

May 31, 1957

Mr. K. E. Fields
General Manager
U. S. Atomic Energy Commission
Washington 25, D. C.

Dear General Fields:

This is to confirm Mr. Ramey's telephone call to you asking for a letter containing the following information on an unclassified basis, which we would like to have by Saturday, noon, June 1.

(a) A year-by-year estimate from 1945 to now of the amount (number of kilotons equivalent) of fission yield and total yield put into the atmosphere by atomic weapons of all sorts from all sources. This information need not designate which countries or which shots specifically were used to compute the estimate, although this information also would be welcome to the extent it is unclassified.

(b) A list of the weapons test series conducted by each country, to the extent this information is available unclassified.

(c) A list of the number of explosions that have taken place, country-by-country and year-by-year, to the extent this information is available unclassified.

We recognize that some of this information is available in scattered places, but we would appreciate your compiling the latest information you have for us in one document.

Sincerely yours,

/s/ Chet Holifield

Chet Holifield, Chairman
Special Subcommittee on
Radiation



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SECURITY INFORMATION

UNITED STATES
ATOMIC ENERGY COMMISSION

13 October 1952

MEMORANDUM

TO : C. P. Kraker, Deputy Manager, SFOO
FROM : N. E. Bradbury
SUBJECT: SUMMARY OF LASL FULL-SCALE NUCLEAR TEST PROGRAMS
SYMBOL : DIR-764

1. Enclosed herewith is a summary of the LASL full-scale nuclear test programs and their most conspicuous results for weapon development. We have not included tests such as CROSSROADS, JANGLE, TUMBLER, or others which have been sponsored by the military for their own purposes.

2. The deadline for the preparation of this summary has been such that it has not been possible to subject it to detailed checking. For this reason and because the relevant numbers have been strongly rounded off in the interests of simplicity, the data therein should not be used for purposes other than general comparison or discussion.

/s/

N. E. Bradbury
Director

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By authority of U. S. Atomic Energy Commission

Per ~~MA. Belkacem, ASE, ADA, in~~ Date 4-20-53

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SECURITY INFORMATION

ATOMIC ENERGY COMMISSION

13 October 1952

SUMMARY OF LOS ALAMOS SCIENTIFIC LABORATORY
FULL-SCALE NUCLEAR TEST PROGRAMS

Full-scale tests of nuclear detonations are essential to the program of atomic weapon development for the following reasons:

1. Actual test of a nuclear weapon or warhead before it enters the national stockpile.
2. To demonstrate the adequacy (or inadequacy) of current theoretical approaches in order that promising avenues of development may be more fully exploited or given lower priority of attention.
3. To explore phenomena which can vitally affect the efficiency of an atomic weapon but which are not susceptible to prior theoretical analysis of sufficient certainty.
4. To choose between existing theoretical methods of weapon improvement the attack of greatest practical significance.

It is not possible to do more than highlight the significant results of each full-scale nuclear test in the past. Most such programs are interdependent and interrelated. In a large majority of the cases they provide further confirmation of the adequacy of theoretical approaches and predictions; occasionally they indicate further problems to be solved in order to maximize the utilization of active material in a given set of circumstances. In retrospect, some tests now seem obvious; at the time they were striking new explorations into the frontier of nuclear weapons.

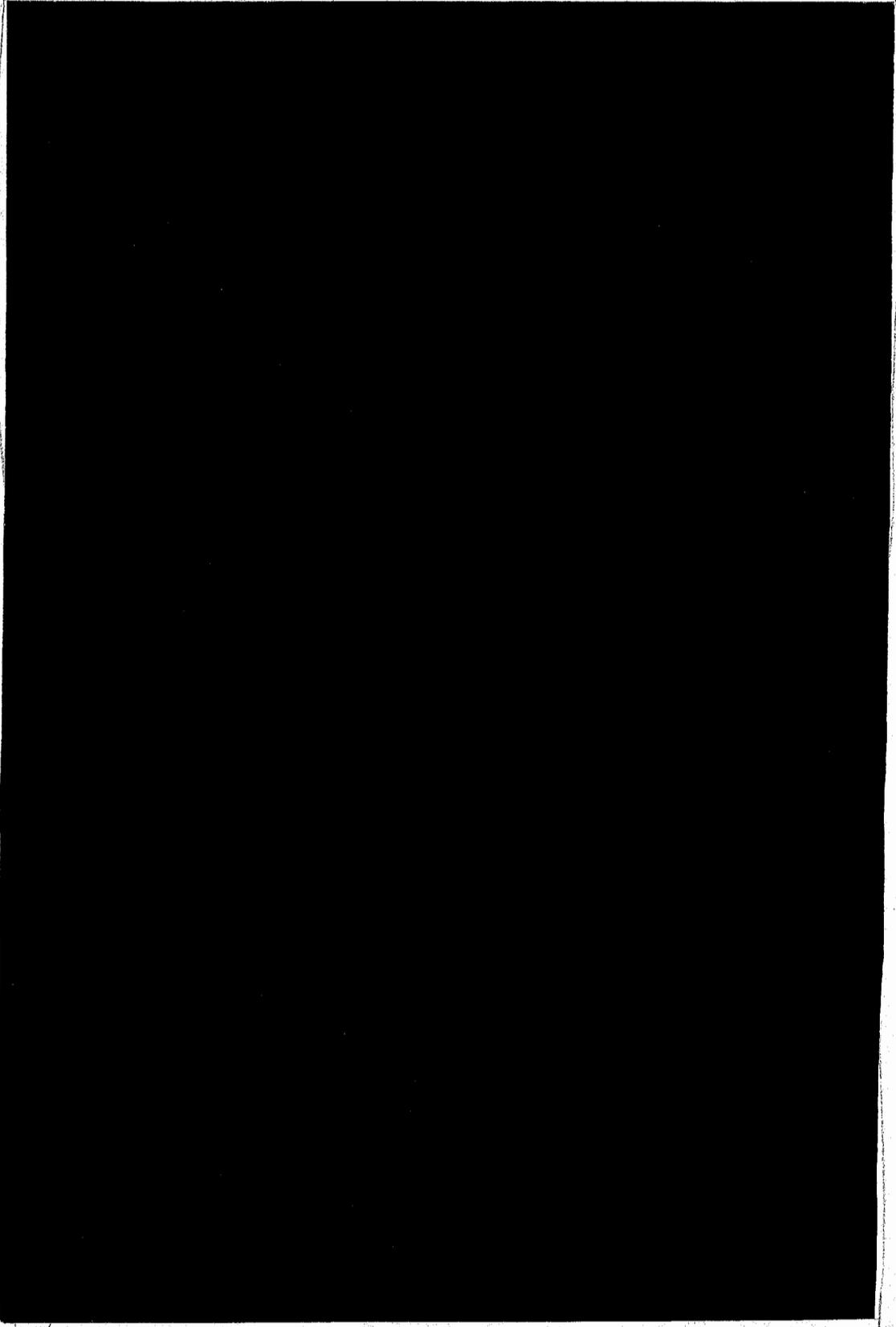
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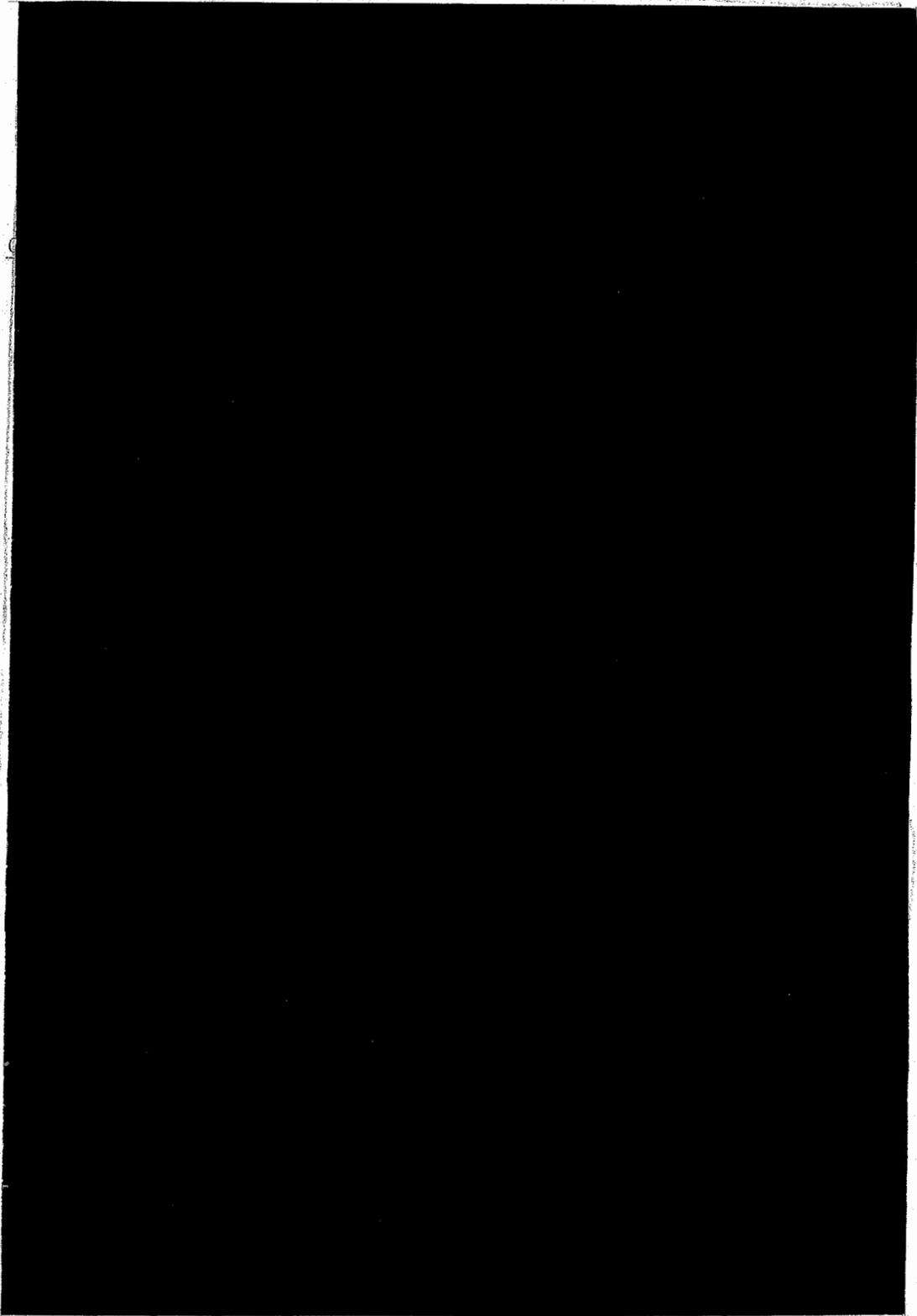
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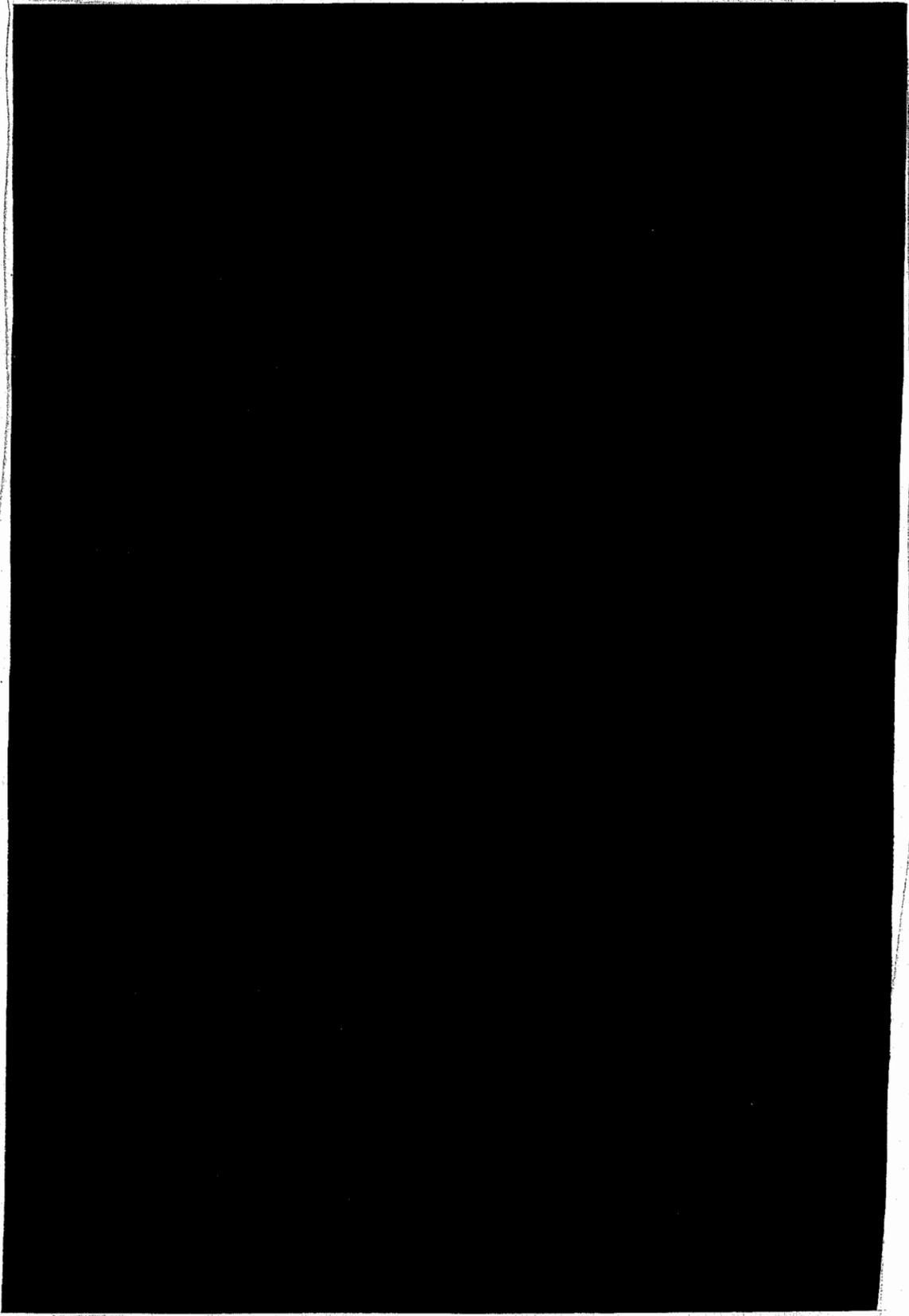


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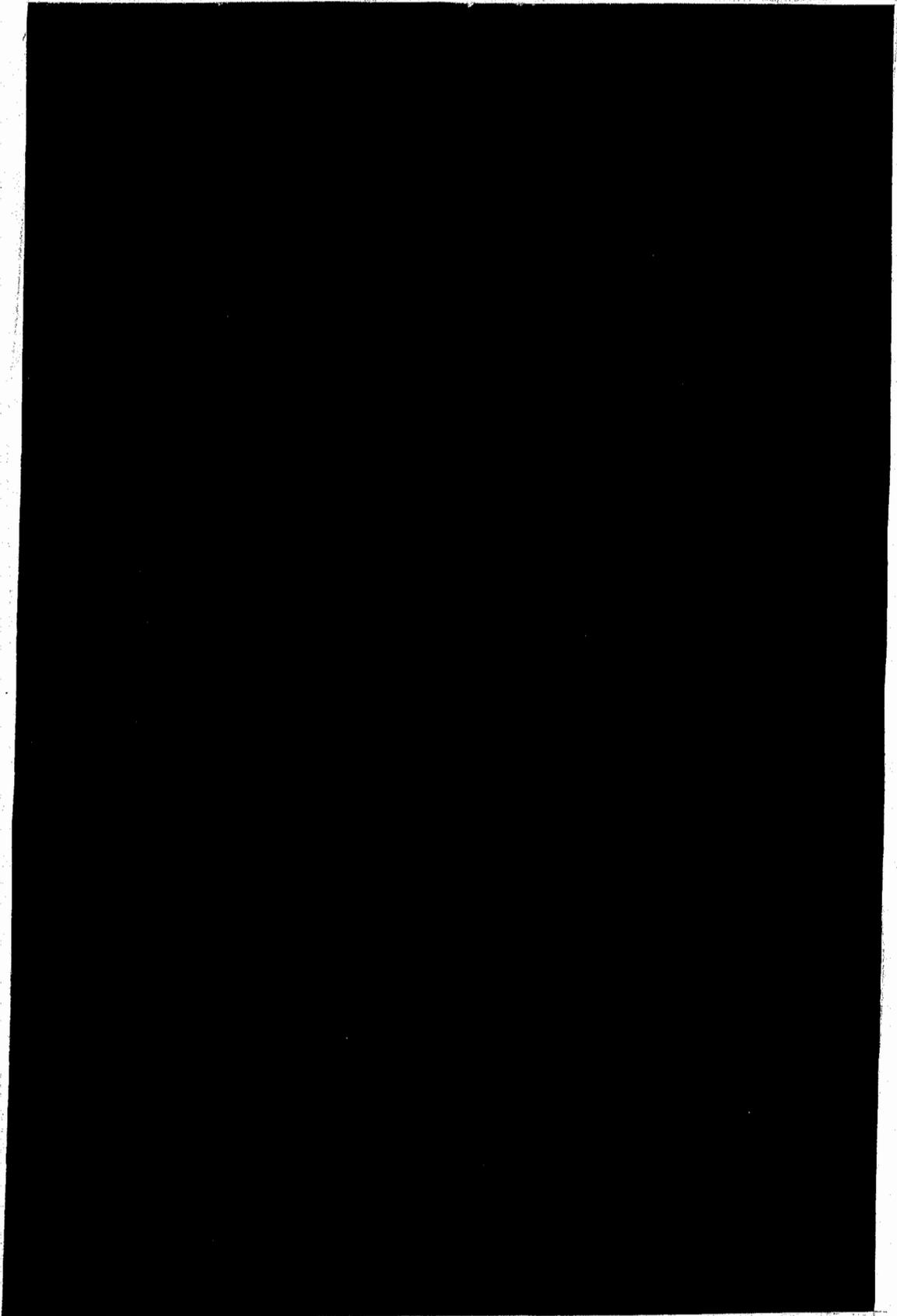


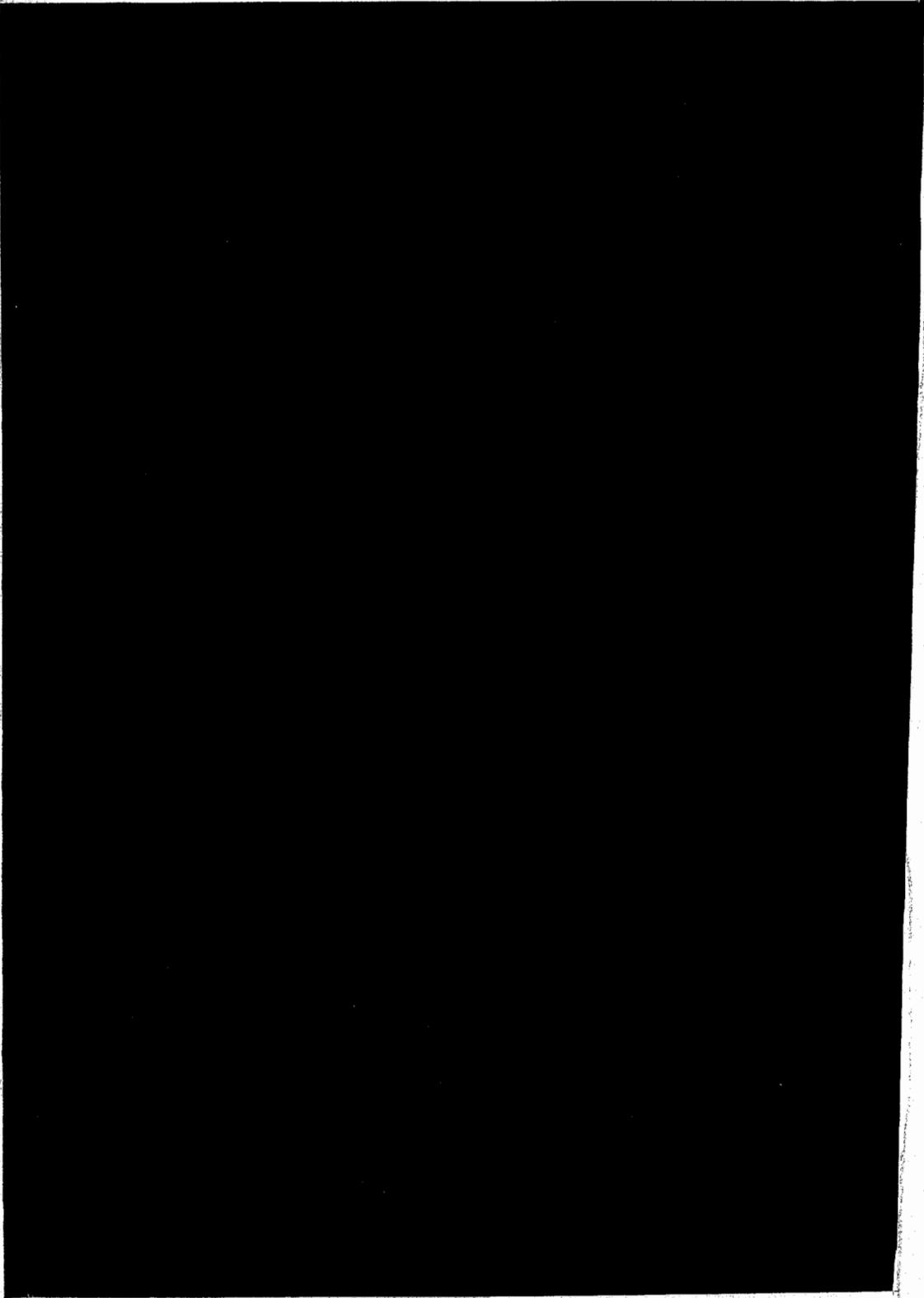


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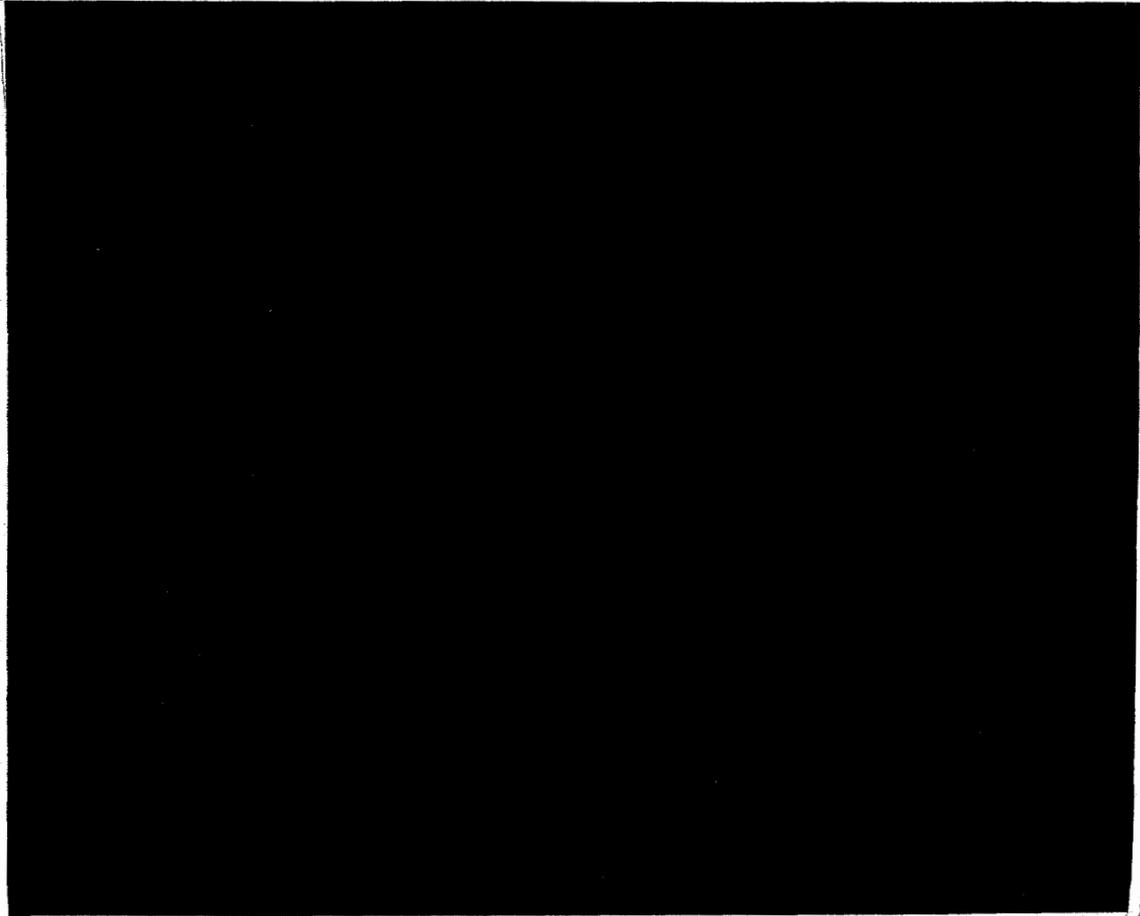


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Test programs of the above nature are an integral part of the program of the LASL. For obvious reasons of safety, it is impossible to study experimentally at Los Alamos the actual phenomena of nuclear explosions. Although all experimental studies using stand-in materials are conducted there up to the actual time that such an explosion would start, the essential feature of the entire procedure can only be conducted and studied under actual conditions with active material at Nevada or Eniwetok. Such test programs without Los Alamos development and interpretation would be almost valueless; on the other hand, without such test programs the real test of LASL effort would not be forthcoming and further development effectively stalemated.

It may be noted that as a consequence of LASL research and development, stimulated by test programs of the type described, the efficiency of the use of fissionable material has increased between two and ten times depending on the specific application; that bombs between 1 KT and several megatons are developed or under development; that weapons have been reduced in weight by a factor of ten and still further reductions may be possible. Had this program not been carried out, a comparable ratio of additional piles and diffusion plants would have had to be constructed whose cost would have completely dwarfed the cost of this research and development. Moreover, research coupled with test programs gives results which make more effective all the active material which has ever been

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produced. New construction for new production can only add more material to be used in the old way. Finally, it may be pointed out that these gains have been accomplished at an expenditure of only about 2.5% of the active material produced for stockpile purposes and at a dollar cost which is probably less than the cost of one Hanford Type pile.

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