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This document consists of 16 pages, 37 fig
No. 44 of 46 copies. Series A

June 20, 1952

MINUTES OF THE THIRTY-FIRST MEETING OF THE THEORETICAL MEGATON GROUP

18 June 1952

1. The thirty-first meeting of the TMG convened at 9:00 AM on Wednesday, 18 June 1952, in the W-Division Conference Room. Those present were:

H. A. Bethe	R. A. Houghton
N. E. Bradbury	R. M. Landshoff
A. A. Broyles	R. B. Lazarus
K. M. Case	C. L. Longmire
F. de Hoffmann	J. C. Mark, Chairman
J. J. Devaney	L. W. Nordheim
C. Evans	J. R. Pasta
F. Evans	J. C. Potts
B. E. Freeman	O. W. Rechard
R. L. Garwin	F. Reines
G. Goertzel	J. R. Reitz
R. W. Goranson	A. Rosenbluth
A. C. Graves	M. Rosenbluth
J. H. Hall	J. L. Tuck
M. G. Holloway	S. M. Ulam

M. C. Walske
E. J. Zadina

DEPARTMENT OF ENERGY DECLASSIFICATION REVIEW
1ST REVIEW-DATE: 8-26-97 DETERMINATION [CIRCLE NUMBER(S)]
AUTHORITY: DADC DADD (1) CLASSIFICATION RETAINED
NAME: 2. CLASSIFICATION CHANGED TO:
2ND REVIEW-DATE: 3. CONTAINS NO DOE CLASSIFIED INFO
AUTHORITY: 4. COORDINATE WITH:
NAME: 5. CLASSIFICATION CANCELLED
6. CLASSIFIED INFO BRACKETED
7. OTHER (SPECIFY):

Topics

2. [redacted]
3. [redacted]
4. Alarm Clock Burning Calculations
5. Experiment on Mixing
6. [redacted]

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2.

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Nordheim discussed the significance of these results in connection with the burning calculation:

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[redacted]

4. Alarm Clock Burning Calculations

Zadina reported on four machine calculations of Alarm Clock models. These are summarized in the accompanying Table II. Except for an error in specific heat, Problem 3 was a SEAC duplication of UNIVAC Problem 2 and is, therefore, not listed. Problems 1 and 2 were reported in LA-1357. Problems 4 and 5 are previously unreported.

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At cycle 4 the system has developed approximately the same energy and tritium content as the problem 1 initial conditions.

Problems 2 and 4

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Table II

Alarm Clock Burning Problems (SEAC and UNIVAC)

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Table II (contd.)

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4.1 Practical Design Considerations for the Alarm Clock

[redacted]

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[redacted]

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5. Experiment on Mixing

This topic was discussed at some length at the 29th meeting (see corresponding Minutes).

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Figure 1.

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Goranson reported on some of the results obtained.

Sweeping Image Cameras

The sweeping image cameras were trained, via mirrors, on the spots indicated as A through J in Figure 2. (2-K is Teller light.) The pipe shields for D and I were evacuated and the others were filled with helium. (It will be observed from the two streak pictures that the luminescence in D and I is quenched by outward expansion of the surface whereas the other spots continue bright from the shocked gas.)

Onset of the Teller light is taken as zero time. This is difficult to determine on some of the streaks. The method used, therefore, was to determine this time where possible and adjust according to the survey data, then use the mean of these values as zero time. The survey assumes the spot to be centered in the 6" diameter mirror and thus there exists a large uncertainty which could amount to 10 shakes. Correction for variation in light path length is not more than 1.5 shakes.

It should be noted therefore that the inferences drawn from these observations are also subject to considerable uncertainty.

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Fig. 2

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Table III

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Fast Framing Cameras

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The following general conclusions may be drawn:

I. The experimental techniques were, on the whole, successful. Some of the features requiring modification are (a) a better system for determining position and alignment than Teller light alone, such as two lights for timing markers on the smears. Two sweeping image cameras were used in this test; it is proposed that three be used on the Ivy test. (b) A reduction in mirror size, possible insertion of slits, and use of shorter focal length lenses in order to decrease uncertainty in position.

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Garwin proposed that argon be used instead of helium in order to intensify the light.

R. W. Goranson

R. W. Goranson

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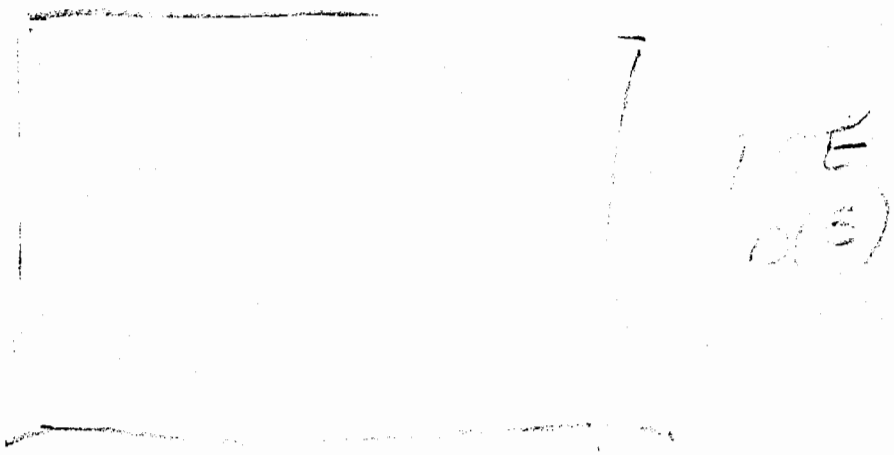
Streak pictures of the various spots on the iron box from sweeping image cameras.



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Selected frames from high speed framing camera

Camera speed 1.71 frames/μsec.

(Outside width of cab is 16'4")

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Selected frames from high speed framing camera

Camera speed 3.11 frames/μsec.

(Vertical resolution poor due to periscope mirror astigmatism)

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