

~~OFFICIAL USE ONLY~~

C 20

Office Memorandum • UNITED STATES GOVERNMENT

TO : C. L. Dunham, M.D., Director
Division of Biology and Medicine

DATE: July 22, 1959

FROM : George T. Anton, Radiation Effects of Weapons Branch
Division of Biology and Medicine

US DOE ARCHIVES
328 U.S. ATOMIC ENERGY
COMMISSION

SUBJECT: CONFERENCE ON CHORIORETINAL BURNS (TRIP REPORT)

Collect. DBm

SYMBOL: BMREWB

Box 3379

Folder 3

Dr. Herman Hoerlin of LASL chaired a classified conference held at LASL, 15 July, on the above subject. There were about 40 attendees from organizations such as LASL, ALO, UCRL, Naval Special Projects at Brooklyn Navy Yard, Medical College of Virginia at Richmond, AFSAM and DASA.

Full coverage is expected in a week or two when the classified proceedings are in hand. Meanwhile, this general report will be kept unclassified.

Hoerlin stated that the principal eye damage factor is the X-ray fire ball - that the case rays are not insignificant but small in comparison.

Test data were reviewed showing retinal burn diameters of 2.2 mm when viewed from a shorter distance - decreasing to 0.49 mm diameter at the longest distance of the test. Other data indicated a threshold image of about 0.2 mm diameter below which retinal burns may not occur. One theory explaining it is that heat is conducted away much more rapidly to the surrounding tissue as the relative size of the exposed area decreases. This physical factor differs in the primate eye which does not have the peripheral circulation found in the rabbit eye. Primate work is needed to correlate rabbit data. Focal length of the rabbit eye is about 10 mm as compared with 17 mm for the human eye. Eye separation from a heat burst occurs at the sclera.

Hoerlin felt that terms of reference for further research could be stated in 3 limiting requirements: (1) pulse duration of ~ 100µ sec.; (2) retinal image sizes of ~ 10µ φ; (3) object brightness of ~ 10⁶ to 10⁹ watt/cm² steradian unresolved.

Wave length range of 4000 to 8000 Å⁰ is assumed to have 50% transmission in the eye. Spectral quality and eye transmission were not controversial in this discussion.

CONFIRMED TO BE UNCLASSIFIED
DOE OFFICE OF DECLASSIFICATION
R. A. CARPENTER, A.O.D. DATE: 8-20-74
R. A. Carpenter

ADMINISTRATION & MANAGEMENT

15-1

~~OFFICIAL USE ONLY~~

C. L. Dunham, M.D.

- 2 -

Employing a single altitude, a tabulation was given showing air masses one would look through when viewing from various angles (distances). Tabulation is adjusted for earth's curvature and decrease in air density with altitude.

A LASL representative went through calculations to obtain cal./cm² exposure on the retina for an array of altitudes and distances of exposure. His approach and methodology was not seriously questioned. One representative stated that from his viewpoint his greatest and overriding concern was flash blindness. He felt that even short periods of blindness presented a serious situation in his business.

cc: Dr. Shilling
Dr. Western
Dr. Claus
Dr. Beard
Mr. Johnston
Mr. Corstie