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FOLDER

Operation Crossroads

LH:mas

27 February 1946

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TO: Colonel S. L. Warren, MC, AUS.

FROM: Doctor Louis Hempelmann.

Subject: Glasses for Visualizing Test at Operation CROSSROADS.

1. The following information was relayed to me today from Los Alamos.

A. Tests of the polaroid glasses indicate:

All except 1/72 of 1% of all light below 4050 Angstrom units is absorbed.

From 4050 to 4500 Angstrom units only 1/4 of 1% of the light gets through.

It is the opinion of optical experts at Los Alamos that appreciable amounts of infra red light get through polaroid lenses.

B. Tests on all exposed film indicate that all light below 4500 Angstrom units is absorbed. However, it is thought that infra red light also gets through this type of filter in appreciable amounts.

C. Lincoln supervisibility lenses, shade #10, (Lincoln Electric Company, Cleveland, Ohio) appear to be the only satisfactory glasses. They absorb 99.75% of ultra violet light and 99.25% of all infra red light.

D. According to Dr. Brooks, damage to the eye occurs both from the ultra violet light which causes conjunctivitis, and from the infra red spectrum which causes cataracts. Of the two, the infra red would seem to be the most damaging. In the opinion of Brooks, the use of goggles allows time for the pupil to accommodate so that it is more important to have good glass in goggles than in filters which are placed before the eye immediately before the shot.

E. Hirschfelder states that observers at 10-20 miles can safely look at the explosion with the naked eye, provided they are completely blacked out during the first 50th of a second following the shot.

F. It is the feeling of the combined group of experts at Los Alamos that (a) either film or polaroid goggles will be satisfactory for observers at 10-20 miles, provided they face away from zero point, and that (b) it is essential for pilots going toward zero to have the Lincoln supervisibility lenses made in the form of goggles.

LOUIS HIRSCHELFELDER