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BIOLOGY TESTS PLANNED FOR UPSHOT AND KNOTHOLE



SYMBOL: BMB:HHP

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I. In accordance with the suggestion of the Test Committee of 20/10/52, the Biology Branch submits the following preliminary schedule for tests of genetic effects of irradiation from the explosions. These are designed to give data for comparisons of the effects of fast neutrons of high energies with those from thermal neutrons and with gamma rays. It is expected that the dosage ranges indicated for Series A will be covered by the distribution of the lead hemispheres at six appropriate distances from the zero point for the most favorable drop. It is hoped that the same location can be utilized in the second drop, though the absolute energies will be different. When the exposure plan can be discussed with the individual investigators who will do the studies of the exposed material, it is possible that minor changes in the dosage may be suggested. In addition, dosage changes may be indicated for the second shot by examination of the results from the first.

II. It is planned that the material to be tested shall be placed in stoppered aluminum vials ½" diameter by 4" long (outside measurements) tied together in blocks of 16 vials. Each block will be 4" x 2" x 2" or 16 cubic inches volume. These vials are to be furnished by the test organization. In each of the lead hemispheres used, it is desired that space be made available for 12 such blocks or 12 x 16 cubic inches = 192 cubic inches total.

The volume suggested for the shelter tests has not been estimated since it will be a very small inclusion in a much larger space.

Temperature control at 70°F ± 5° is satisfactory for all tests.

III. If desired, H. H. Plough is prepared to act as coordinator for the genetics test program. He can make arrangements for preparation of the materials by the listed investigators, for shipment to the test site, for return shipment, and for assembling reports of data secured to the Director.

IV. The projected tests are as follows together with the gamma ray equivalent dosages which may be expected to give the most useful data in themselves and for comparison with other kinds of radiation.

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Genetics Test Program

A. Fast Neutron Irradiation Alone - lead hemispheres located to cover the ranges indicated.

| No. | Investigator | Location | Subject | No. ½" vials Needed | Optimum dosage in r units | Range of dosage in r units |
|---|---|---|---|---|---|---|
| 1 | Kirby - Smith | Oak Ridge | Tradescantia buds chromosome breaks | 32 | 300 r | 50 - 800 |
| 2 | Atwood | Oak Ridge | Neurospora reverse mutations | 16 | 100,000 r | 20,000 - 150,000 |
| 3 | Mickey | Oak Ridge | Drosophila flies somatic mutations | 16 | 4,000 r | 1,000 - 10,000 |
| 4 | Lewis | Cal Tech | Drosophila chromosome breaks | 32 | 4,000 r | 1,000 - 10,000 |
| 5 | Gowen | Iowa State | Drosophila LD 4 1st gen lethals | 32 | 4,000 r | 1,000 - 10,000 |
| 6 | Ives | Amherst | Drosophila autosome lethals | 16 | 4,000 r | 1,000 - 10,000 |
| 7 | Stone | Texas | Drosophila sex chromosome lethals | 16 | 4,000 r | 1,000 - 10,000 |
| 8 | Kayhart | Penn. | Mormoniella (wasp) visible mutations | 16 | 5,000 r | 1,000 - 10,000 |
| 9 | Blakeslee | Smith | Datura seeds, abnormal pollen | 16 | 500 r | 50 - 5,000 |

B. Neutron plus Gamma Irradiation - placed in shelters

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 - 9 | Same as 1 - 9 above | | | | | |
| 10 | Russell | Oak Ridge | Pregnant mice | | 400 r | 100 - 800 |
| 11 | Gowen | Iowa State | 4 strains of mice | | 400 r | 100 - 800 |

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V. Criticisms or suggestions concerning the above schedule will be appreciated at an early date so that they can be incorporated before arrangements are made with the investigators involved.

cc: Dr. Alexander Hollaender, Oak Ridge
Dr. John C. Bugher ✓
Dr. Paul B. Pearson