

file in a Rad Studies

195

405112

REPORT OF SUBCOMMITTEE ON
LONG TERM PRIMATE RADIATION PROBLEMS

The Committee met on January 30, 1953 at the National Institutes of Health, Bethesda. Those present were H. J. Curtis, Jacob Furth, R. S. Snider, Earl Engle, N. W. Shock.

Discussion was confined to eight topics as follows:

(1) The desirability of a project to study the long-term radiation effects in primates: It was pointed out emphatically that there has been a tremendous effort expended in studying the acute effects of radiation damage in animals and man, but relatively little in studying the long-term effects. During the war a fairly large group of rodents was studied for the long-term effects of gamma rays, fast neutrons, and slow neutrons, but these studies have never been completely finished. A few experiments by Lorenz and others are under way in rodents, but it is a small effort. The studies of the Japanese population subjected to the atomic bombings is being carried on, but even at an enormous effort the results will be slow in coming and preliminary in nature at best. Dosages were difficult to estimate and the population has been widely scattered.

R

Present indications are that the late effects of radiations are qualitatively about the same for x-rays, gamma rays, fast neutrons and slow neutrons. The animals die prematurely, and from about the same causes as do normal animals. There may be quantitative differences in tumor incidence for particular tumor types, etc., but so far no qualitative differences, other than decreased life span, have been noted between irradiated and control animals. However, there is literally no data on animals higher than rodents. The group was unanimous in feeling that the extrapolation from mouse to man, in this case, would be virtually worthless. There was some feeling expressed that man might be considerably more susceptible to this type of radiation injury than the lower animals because of the relatively poor circulation in man, but this is admittedly a guess.

It appears that the problem is closely linked with, or perhaps identical with, the problem of aging. Dr. Shock gave a review of the present state of research in the field of gerontology. There are a very few studies of the fundamental mechanisms of aging; a few studies with rodents, especially with reference to the effect of nutrition on life span; and a few clinical studies on aging, the most extensive one being his own

US DOE ARCHIVE
326 U.S. ATOMIC ENERGY
COMMISSION

RG DOE HISTORIAN (DBM)

Collection 1132

Box 3365

Folder # 24

in Baltimore. He emphasized that a study on the aging process in sub-human primates has been badly needed for a number of years, but the magnitude of the undertaking has prevented anyone from undertaking it so far.

The question was raised as to the desirability of getting more background information on other animals before going to monkeys. The group was unanimous in feeling that more information from lower animals would not help substantially in this study. The only other larger animal considered was the dog, and it was pointed out that the experiment would be just as costly, in time and money, as the experiment on the monkey, and would not take the place of the monkey experiment.

It was thus the unanimous and emphatic consensus of the meeting that, with the wide-spread use of radiation today, and its possible use in warfare, no time should be lost in initiating a study in monkeys.

(2) The magnitude of the project: There were various estimates of the desirable number of monkeys to be used, ranging from 200 to 1000. A reasonable goal appeared to be about 600, although it would not be necessary to start with this many. The consensus was in favor of using the Macacus, imported from India, prepubertal, and the age estimated from the teeth. Some in-utero irradiation experiments should be done. The figure of 600 monkeys should give enough for several dosage levels, with enough in each group so that experiments of different sorts can be done on sub-groups, and with adequate controls for all of them.

(3) The location of the project: It was the consensus that climate should not be considered as a factor in selecting the location of the project. The Macacus is not a tropical animal and if given adequate space will thrive in climates such as that of Wisconsin.

There was considerable sentiment against establishing such a project at a university because of the magnitude of the project and its long term nature. This is more in the nature of programmatic research, and universities are not as suitable for this sort of research as a Government laboratory such as the National Institutes of Health or one of the Atomic Energy Commission laboratories. There was strong sentiment against putting it at a small laboratory like Orange Park, since there should be a large active scientific group there all the time, not only those working directly on the primate problem, but it should be part of a scientific community, with a good library, etc. This project will require a good deal of space, and an estimate of 30 acres of land, as a minimum, has been made.

(4) Observations to be made: It was felt that, within reason, all possible observations should be carried out. Psychological tests were felt to be very important, as well as physiological tests, especially those which tested the response of the animal to stress. Pathology should, of course, be well done, and this means designating animals for sacrifice at definite intervals.

(5) Necessary scientific staff: It was felt that there should be a permanent staff of an experimental psychologist, pathologist, biochemist, and physiologist. These should carry on the basic scientific program, but a good deal of the work should be done by visiting scientists. Such persons would come in perhaps once a year for a few weeks to carry on observations. In this way the program could be kept as a National project and not specifically the project of any one laboratory.

(6) Duration of project: The life span of a monkey is about 20 years, and it was felt that if there could not be reasonable assurance of a 20 year duration of the project, it should not be undertaken. This does not mean that there will be no results for 20 years. There should be important results for the first year, but it would be very wasteful if the project was not brought to its full fruition.

(7) The cost of the project: The initial cost of the project is in the laboratory building and animal quarters. It is very doubtful if a suitable place could be found, so this would have to be largely new construction. A very preliminary estimate might be made as follows:

10 laboratories, 400 sq. ft. ea. at \$60 per sq. ft.	\$240,000.00
10 offices, 150 sq. ft. ea. at \$30 per sq. ft.	45,000.00
Corridors and services, 1000 sq. ft. at \$25 per sq. ft.	25,000.00
30 animal rooms with outdoor runs, 400 sq. ft. ea. inside at \$8,000 ea.	240,000.00
Initial equipment	<u>50,000.00</u>
TOTAL - - - - -	\$600,000.00

The yearly cost would be about as follows:

Professional personnel (physiologist, biochemist, pathologist, veterinarian, psychologist)	\$ 45,000.00
Technicians, 10 at \$3,300.00	33,000.00
Office and supervisory, 3 at \$3,600.00	10,800.00
Animal caretakers, 4 at \$3,000.00	12,000.00

Travel and consultants fees	40,000.00
Animal food (\$100.00 per monkey year)	60,000.00
Materials and supplies	25,000.00
Capital equipment	10,000.00
Overhead	
TOTAL - - - - -	<u>\$435,800.00</u>

(8) Recommendations: The Committee strongly recommends that this program be initiated as soon as reasonably feasible. If this report is accepted by the full committee, it is then recommended that this sub-committee be abolished, having fulfilled its function, and a new committee be appointed to put this program into effect. This would involve selecting the site, the program director, and acting in a general advisory capacity in getting the program started.

US DOE ARCHIVES 326 U.S. ATOMIC ENERGY COMMISSION	
RG	<u>DOE Historian (DBM)</u>
Collection	<u>1132</u>
Box	<u>3365</u>
Folder	<u>24</u>

2025 - T6
NTM

Persons accepted by the above named institutions for pre and post doctoral training and research in the practical application of A.C. will spend 6 to 18 ^{or actual} ~~months~~ as a participant with a research group ^{using the tools of atomic energy} under the leadership of an outstanding scientist working in the field of science constituting the applicant's principal interest. It is recommended that those not previously ~~known~~ familiar with the use of radioisotope techniques plan to take the regular O.R.I.S. radioisotope training course referred to above before embarking on this type of training.

In addition the Harvard University medical physics laboratory, the New England Cancer Research Laboratory in Boston and the Western Reserve University School of Medicine offer similar opportunities in - biophysics - pathology, radiation toxicity and biochemistry. For from 2 to 6 per student scientists each year each year.